

Federal 3535 1 Series Datasheet



Features :

- High lumen performance
- Promising lumen maintenance characteristics
- High efficiency package
- Level 1 on JEDEC moisture sensitivity analysis
- Max pulse current :1,000mA
- RoHS compliant

Typical Applications :

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



Lighting Design Manufacturing Service

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Lighting Design Manufacturing Service

General Information

Introduction

Federal 3535 is a surface mount, compact, high brightness LED that is built for various illumination needs. A single Cool White Federal 3535 can deliver typical luminous flux of 115 lm while driving at 350mA suitable for any kind of lighting sources, including general illumination, flashlights, streetlights, spotlights, industrial and commercial lightings. The small physical dimension can free customers from any constraints or limitations in these fields of applications. Furthermore, the reflow-solderable nature of Federal 3535 provides an easy path towards the optimum thermal management to achieve a promising reliability. In conclusion, Federal 3535 offers 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 3535 Nomenclature

<u>EF</u>		<u>E</u> <u>W</u>		<u>1</u> <u>B</u>		<u>E</u> <u>1</u>		<u>-</u> <u>F</u>		<u>1</u>
X1		X2		X3		X4		X5		X6
LED Item		Module		Emitting Color		Current		Dimension		
Code	Type	Code	Type	Code	Type	Code	Type	Code	Type	
EF	Federal	E	Emitter	W	Cool White	1	350mA	B	3.5x3.5mm	
		S	Star	H	Neutral White					
				X	Warm White					

X6		X7		X8		X9	
Housing Item		Serial Number		Serial Number		Serial Number	
Code	Type	Code	Type	Code	Type	Code	Type
E	E-type	-	-	-	-	-	-

Mechanical Dimensions

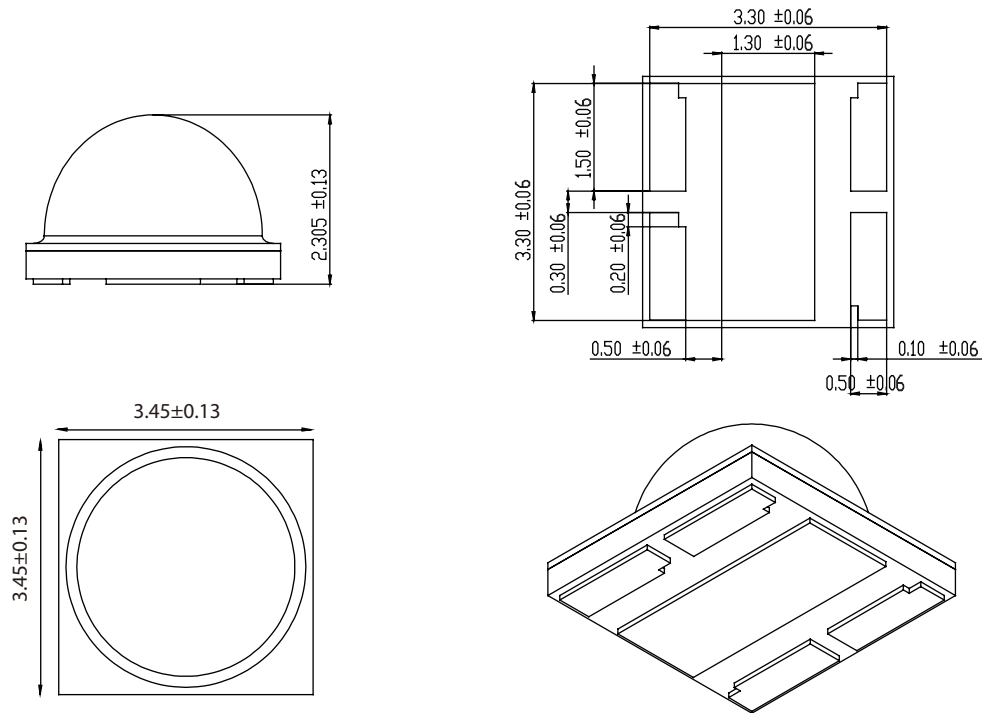


Figure 1. Federal 3535 series Dimension

Notes:

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

Star PCB Type Dimension

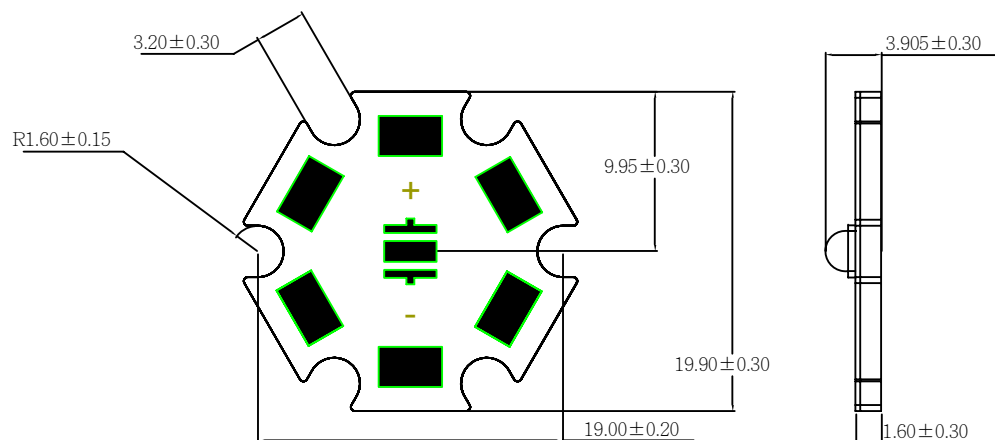
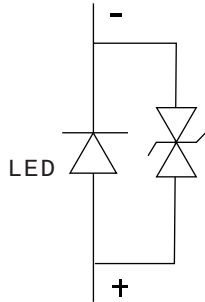


Figure 2. Federal 3535 series Star PCB type Dimension

Notes:

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

Circuit



PCB Layout

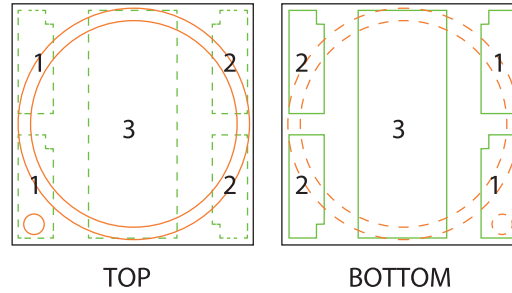


Table 2. Pad Configuration

PAD	FUNCTION
1	ANODE
2	CATHODE
3	THERMAL

Figure 3. Federal 3535 series circuit and pcb layout

Note:

The thermal pad is electrically isolated from anode and cathode.

Solder Pad

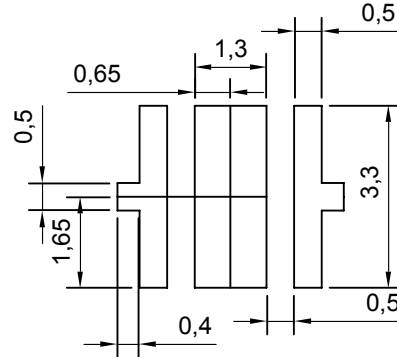


Figure 4. Federal 3535 series solder pad

Absolute Maximum Ratings

The following tables describe flux of Federal 3535 series under various current and different color.

Table 3. Federal 3535 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	150	°C
Operating Temperature		-40 ~ +80	°C
Storage Temperature		-40 ~ +120	°C
ESD Sensitivity		8,000	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.

Luminous Flux Characteristic

The following tables describe flux of Federal 3535 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
1W	EFEW-1BE1-F1	Cool White	U3	100	173
			V1	112.5	194.6
	EFEH-1BE1-F1	Neutral White	T3	80	138.4
			U1	86.5	149.6
			U2	90	155.7
	EFEX-1BE1-F1	Warm White	T2	70	121.1
			T3	80	138.4
			U1	86.5	149.6
			U2	90	155.7

Note:

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

Characteristics

Optical Characteristics

Table 5. Optical characteristics, $T_j=25^{\circ}\text{C}$ at 350mA and 700mA

Power Consumption	Part Name	Color	CCT/Wavelength (K)			CRI	Viewing Angle (Degree)
			Min.	Typ.	Max.		
1W / 3W	EFEW-1BE1-F1	Cool White	5,000	--	10,000	70	115
	EFEH-1BE1-F1	Neutral White	3,800	--	50,00	75	115
	EFEX-1BE1-F1	Warm White	2,670	--	3,800	80	115

Notes:

1. Wavelengths are stated as peak wavelength.
2. 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.

Electrical Characteristics

Table 6. Electrical characteristics at $T_j=25^{\circ}\text{C}$

Power Consumption	Part Name	Color	V_F (V)			Forward Current I_F (mA)	Thermal Resistance ($^{\circ}\text{C}/\text{W}$)
			Min.	Typ.	Max.		
1W	EFEW-1BE1-F1	Cool White	3.0	3.4	3.7	350	9
	EFEH-1BE1-F1	Neutral White	3.0	3.4	3.7	350	9
	EFEX-1BE1-F1	Warm White	3.0	3.4	3.7	350	9

Note:

Edison maintains a tolerance of 0.06V on forward voltage measurement.

JEDEC Moisture Sensitivity

Table 7. JEDEC Moisture Sensitivity

Level	Floor Life		Soak Requirements	
	Time	Conditions	Standard	
			Time (hours)	Conditions
1	unlimited	$\leq 30^{\circ}\text{C}$ / 85% RH	168+5/-0	85 $^{\circ}\text{C}$ / 85% RH

Characteristic Curve

Spectrum

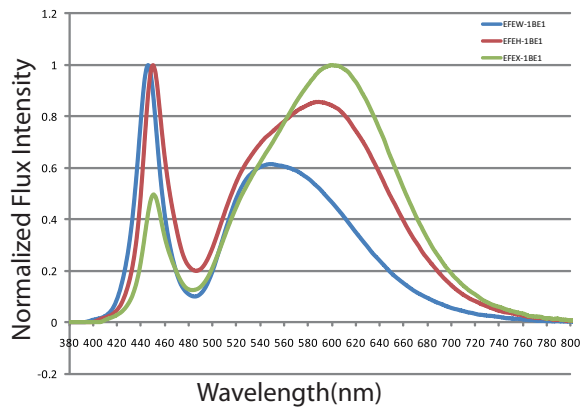


Figure 5. Color Spectrum for White series at $T_j=25\text{ }^{\circ}\text{C}$

Radiation Diagram

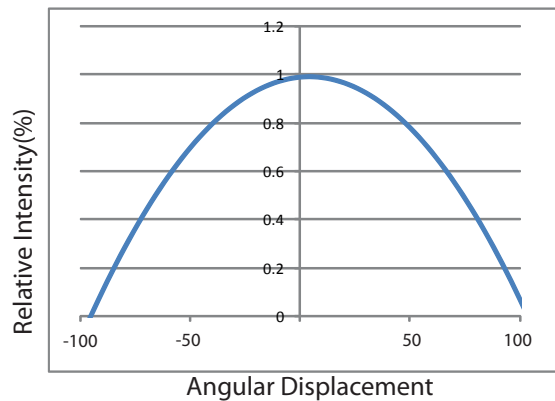


Figure 6. Emission Angle

Luminous Flux & Junction Temperature

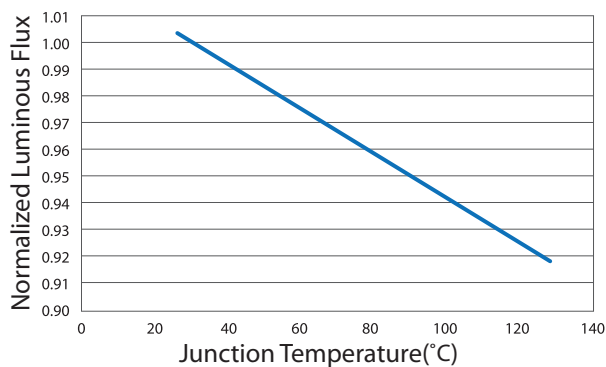


Figure 7. Relative luminous flux vs. thermal pad temperature for White series.

CCT & Junction Temperature

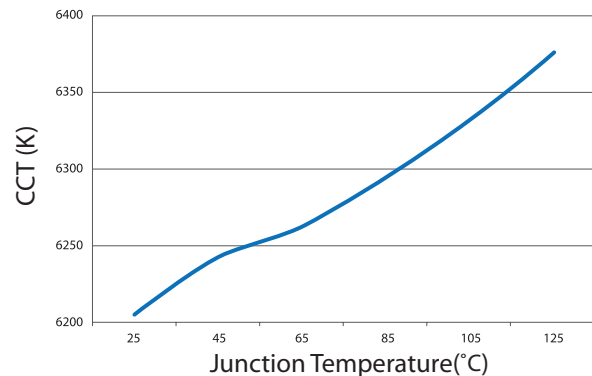


Figure 8. Typical CCT vs. junction temperature for Cool White.

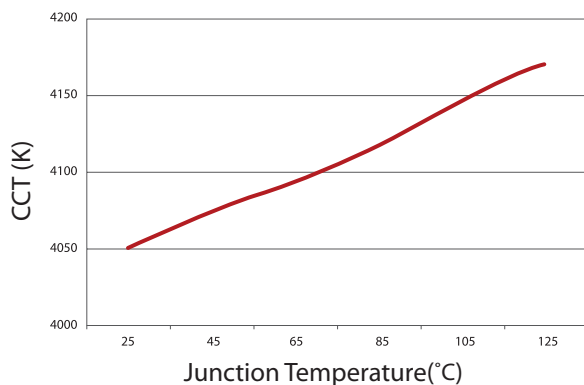


Figure 9. Typical CCT vs. junction temperature for Neutral White

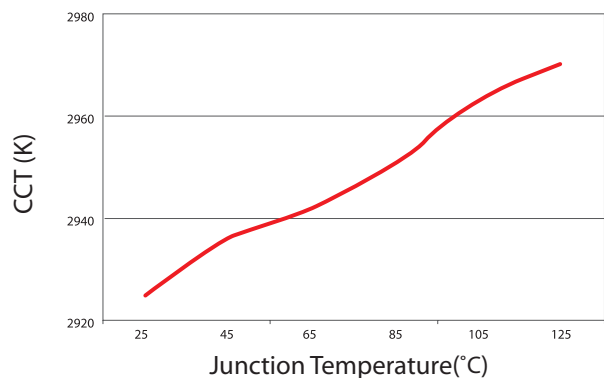


Figure 10. Typical CCT vs. junction temperature for Warm White

Forward Voltage & Forward Current

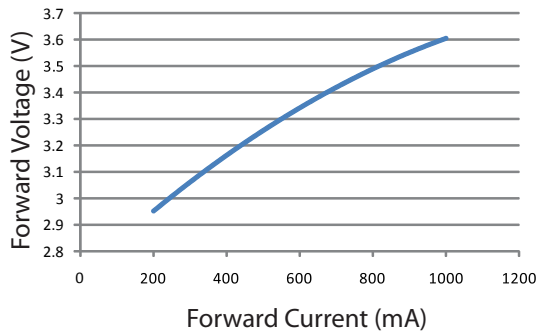


Figure 11. Forward voltage vs. forward current for Cool White, Neutral White and Warm White

Luminous Flux & Forward Current

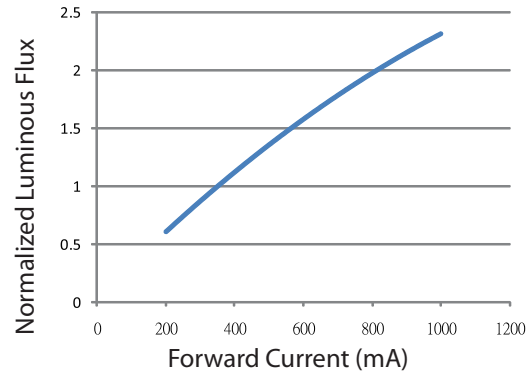


Figure 12. Relative luminous flux vs. forward current for Cool White

CCT & Forward Current

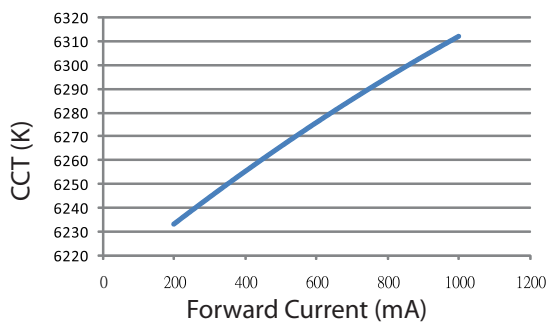


Figure 13. CCT vs. forward current for Cool White.

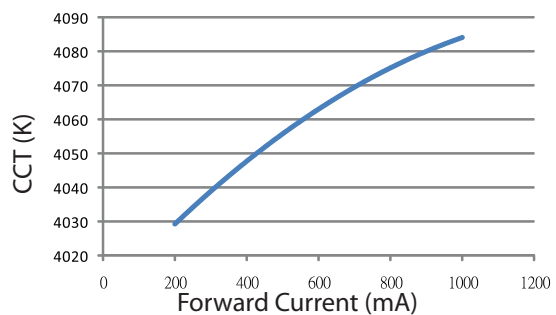


Figure 14. CCT vs. forward current for Neutral White.

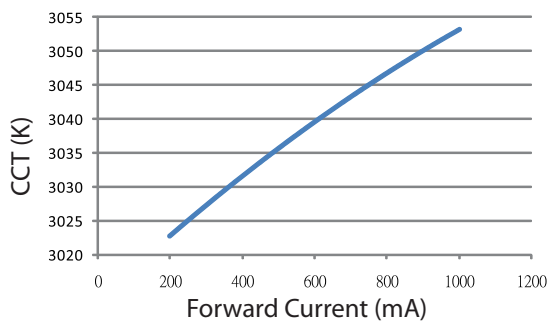
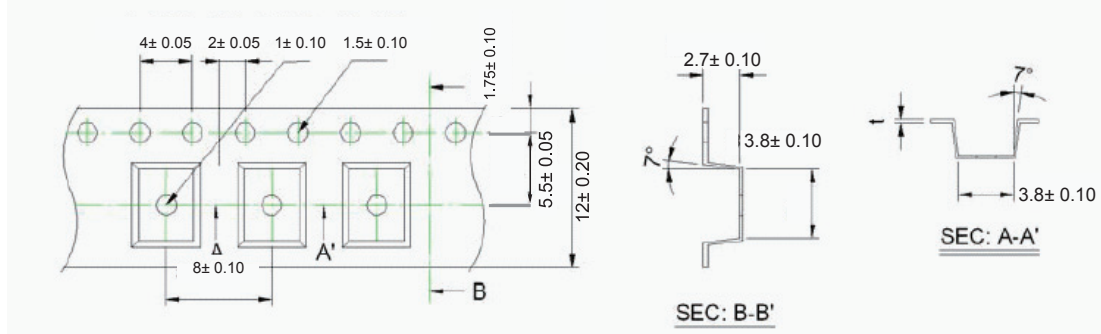


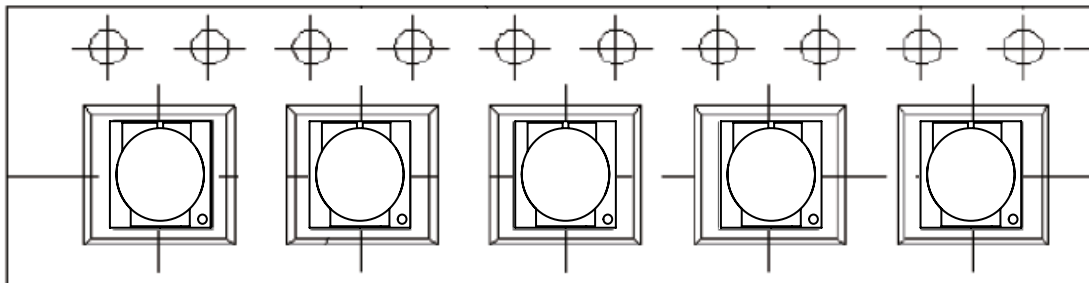
Figure 15. CCT vs. forward current for Warm White.

Product Packaging Information

FX Series



CATHODE SIDE



ANODE SIDE

Figure 16. Federal 3535 Reel Dimensions.

Table 7. Federal 3535 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

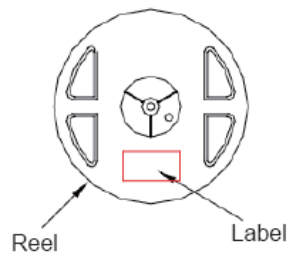


Figure 17. Taping reel dimensions

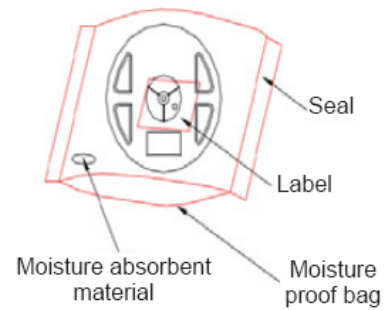


Figure 18. Federal 3535 Package



Lighting Design Manufacturing Service

Revision History

Table 8. Revision history of Federal 3535 1 series datasheet

Version	Description	Release Date
1	1.Establish a datasheet	2011/11/25
2	1.Add Product Packaging Information 2.Update Luminous Flux Characteristics on P.6	2012/01/12

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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