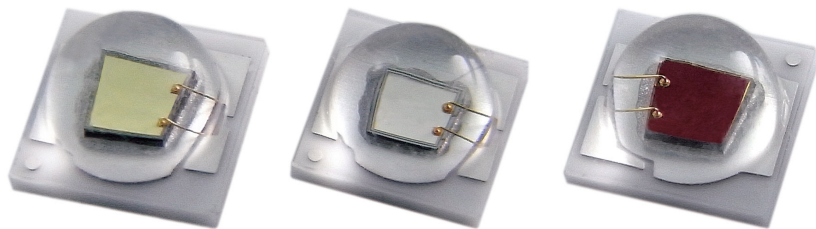


Federal Series

# Federal 3535 Single Color Datasheet



## Features :

- Small emitter size High mount technology
- Superior ESD protection
- Max pulse current : 1,000mA
- Level 1 on JEDEC moisture sensitivity

## Typical Applications :

- Portable camera-phone
- Digital compact camera
- Personal digital assistant
- Caution light



Lighting Design Manufacturing Service

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## General Information

### Introduction

Federal 3535 is a surface mount, compact, high brightness LED that is built for various illumination needs. 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 single color Nomenclature

$\frac{EF}{X1}$     $\frac{E}{X2}$   $\frac{X}{X3}$  -  $\frac{1}{X4}$   $\frac{B}{X5}$   $\frac{E}{X6}$   $\frac{1}{X7}$

X1 LED Item		X2 Module		X3 Emitting Color		X4 Current		X5 Dimension	
Code	Type	Code	Type	Code	Type	Code	Type	Code	Type
EF	Federal	E	Emitter	R	Red	1	350mA	B	3.5x3.5mm
		S	Star	T	True Green				
				B	Blue				
				A	Amber				

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

## Mechanical Dimensions

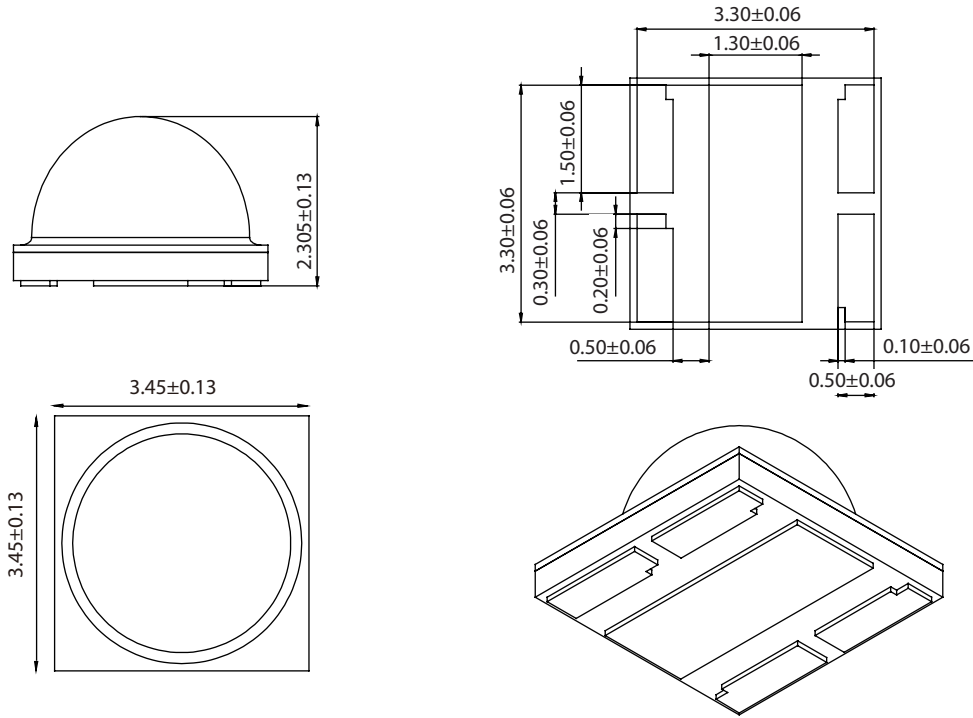


Figure 1. Federal 3535 single color Dimension

Notes:

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

### Star PCB Type Dimension

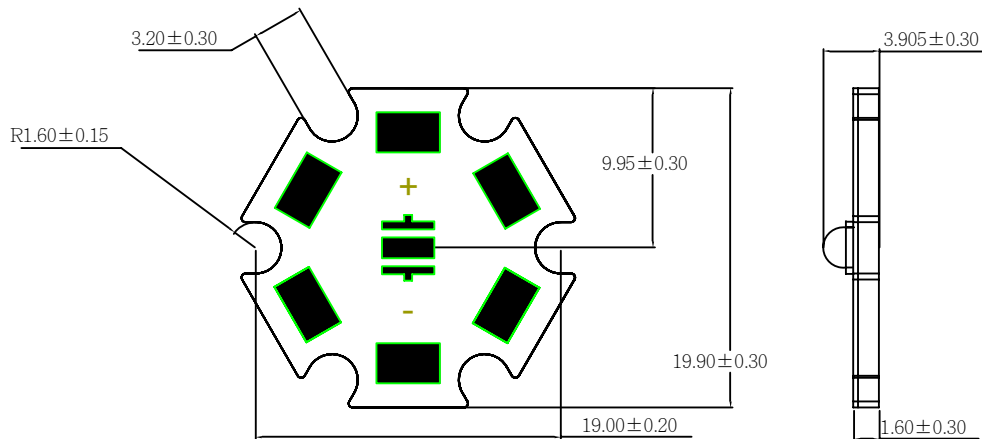
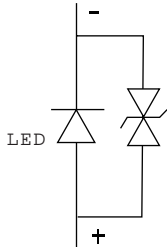


Figure 2. Federal 3535 Star PCB type Dimension

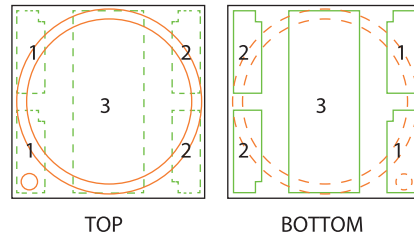
Notes:

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

### Circuit



### PCB Layout



PAD	FUNCTION (Red, Green, Blue, Amber)
1	ANODE
2	CATHODE
3	THERMAL

PAD	FUNCTION (EFER-1BE7)
1	CATHODE
2	ANODE
3	THERMAL

Figure 3. Federal 3535 single color circuit and pcb layout

Note:

The thermal pad is electrically isolated from anode and cathode.

### Solder Pad

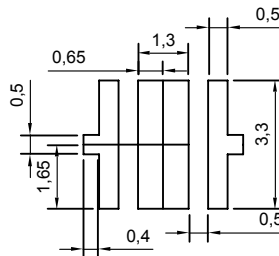


Figure 4. Federal 3535 single color solder pad

## Absolute Maximum Ratings

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

Table 2. Federal 3535 single color absolute maximum ratings

Parameter	Symbol	Value	Units
DC Forward Current <sup>[1]</sup>	$I_F$	350 / 700	mA
Peak Pulsed Current; ( $t_p \leq 100\mu s$ , Duty cycle=0.25)	$I_{pulse}$	1000	mA
Transient Surge Voltage	$V_{TS}$	8	V
Reverse Voltage <sup>[2]</sup>	$V_r$	Note 2	V
LED Junction Temperature <sup>[3]</sup>	$T_J$	150 / 125 <sup>[4]</sup>	°C
Operating Temperature	$T_{opr}$	-40 ~ +80	°C
Storage Temperature	$T_{stg}$	-40 ~ +120	°C
ESD Sensitivity	$V_B$	8,000	V
Allowable Reflow Cycles	n/a	3	cycles
Soldering Temperature	$T_{sol}$	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 3535 single color under various current and different color.

Table 3. Luminous Flux Characteristics,  $I_f=350mA$  and Thermal  $=25^{\circ}C$

Power Consumption	Part Name	Color	Min Luminous Flux (lm)		
			Group	350mA	700mA
1W	EFER-1BE1	Red	R	39.4	74.9
		Red	S	51.2	97.2
	EFET-1BE1	True Green	T	66.5	106.4
		True Green	U	86.5	138.4
	EFEF-1BE1	Blue	M	13.8	23.9
		Blue	N	17.9	31
		Blue	P	23.3	40.3
	EFEA-1BE1	Amber	R	39.4	74.9
		Amber	S	51.2	97.3

Notes:

1. The luminous flux performance is guaranteed within published operating conditions.
2. Flux is measured with accuracy of  $\pm 10\%$ .

## Characteristics

### Optical Characteristics

Table 4. Optical characteristics,  $T_j=25^{\circ}C$  at 350mA

Part Name	Color	CCT/Wavelength (nm)			Viewing Angle (Degree)
		Min.	Typ.	Max.	
EFER-1BE1	Red	620	--	630	140
EFET-1BE1	True Green	520	--	535	120
EFEF-1BE1	Blue	460	--	470	130
EFEA-1BE1	Amber	585	--	595	125

Note:

Edison maintains a tolerance of  $\pm 5\%$  on wavelength measurement.

## Electrical Characteristics

 Table 5. 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	EFER-1BE1	Red	2.0	--	2.4	350	10
1W	EFET-1BE1	True Green	3.0	--	3.8	350	10
1W	EFEB-1BE1	Blue	3.0	--	3.7	350	10
1W	EFEA-1BE1	Amber	2.0	--	2.4	350	10

Note:

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

## JEDEC Moisture Sensitivity

Table 6. JEDEC Moisture Sensitivity

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

## Characteristic Curve

### Spectrum

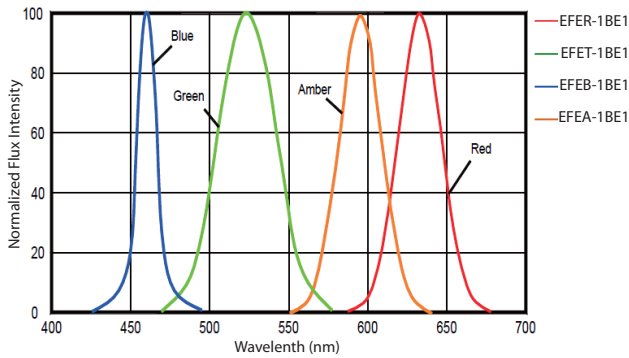


Figure 5. Color Spectrum for Federal 3535 single color at  $T_j=25\text{ }^\circ\text{C}$

### Radiation Diagram

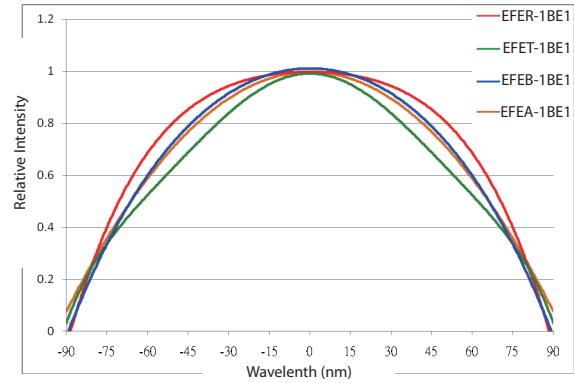


Figure 6. Radiation diagram

### Forward Voltage & Forward Current

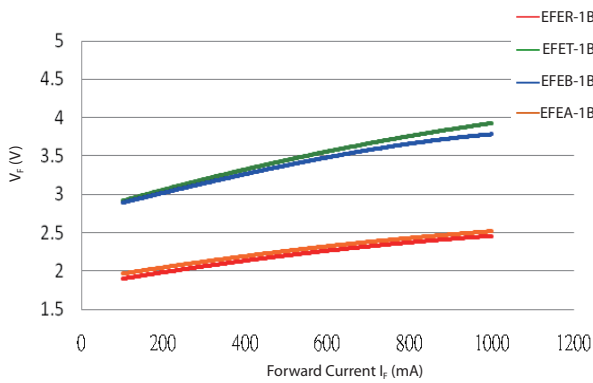


Figure 7. Forward voltage vs. forward current for Federal 3535 single color.

### Luminous Flux & Forward Current

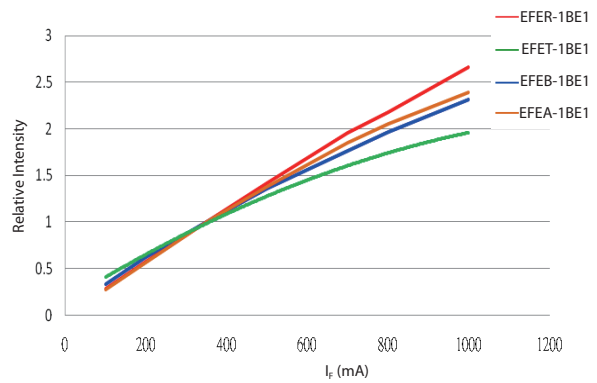


Figure 8. Relative luminous flux vs. forward current for Federal 3535 single color

### Wavelength & Forward Current

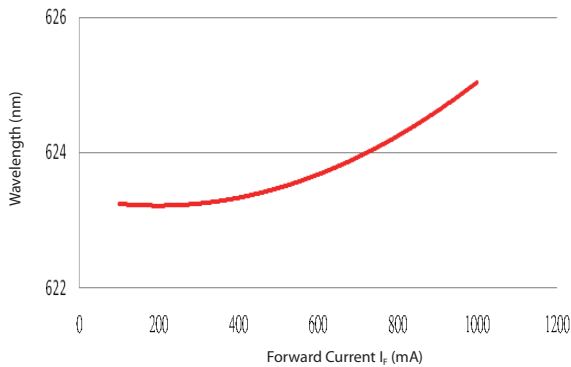


Figure 9. Wavelength vs. forward current for Federal 3535 single color red

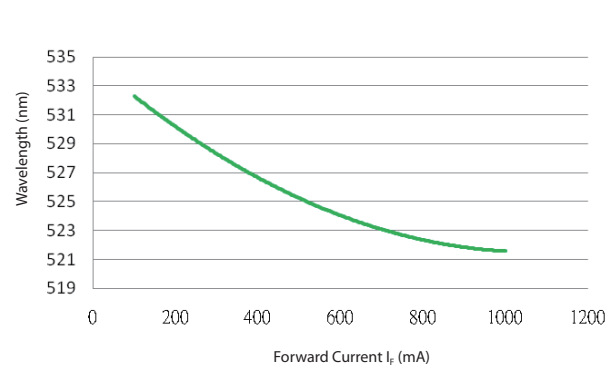


Figure 10. Wavelength vs. forward current for Federal 3535 single color true green



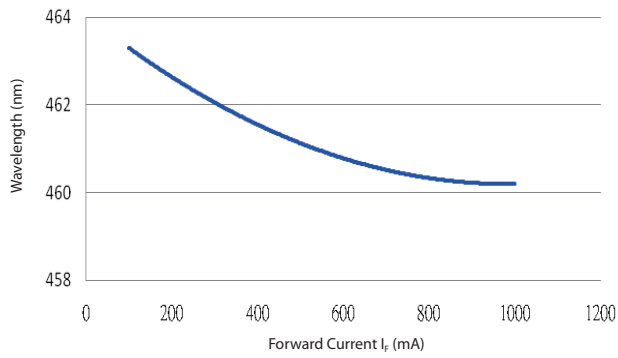


Figure 11. Wavelength vs. forward current for Federal 3535 single color blue

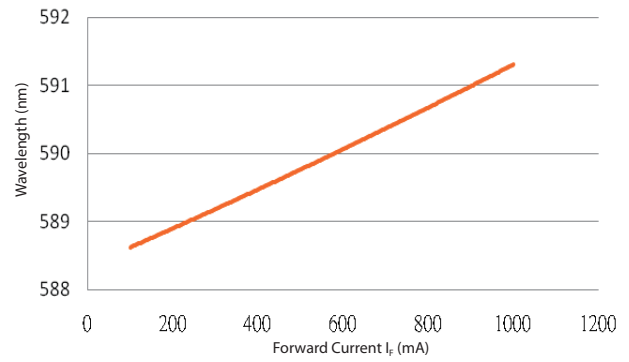
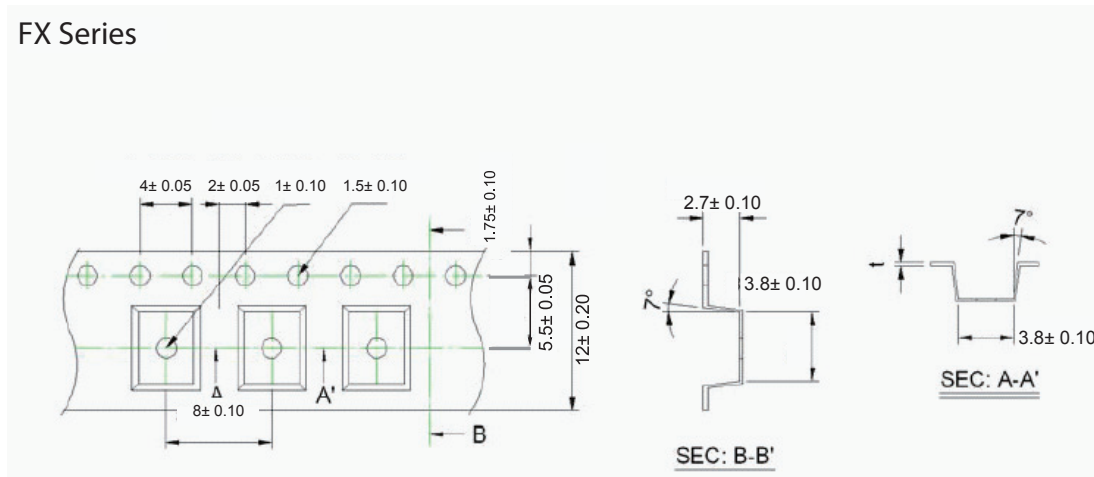


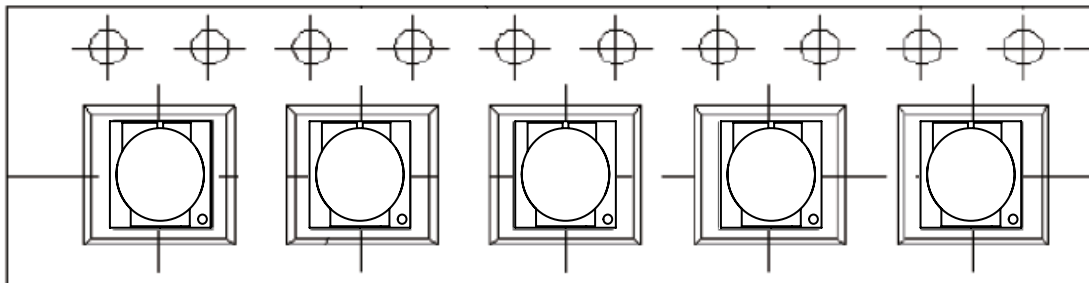
Figure 12. Wavelength vs. forward current for Federal 3535 single color amber

## Product Packaging Information

### FX Series



### CATHODE SIDE



### ANODE SIDE

Figure 13. 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

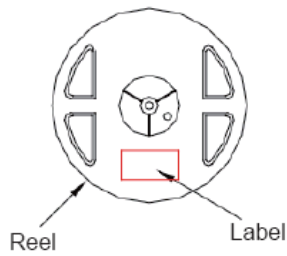


Figure 14. Taping reel dimensions

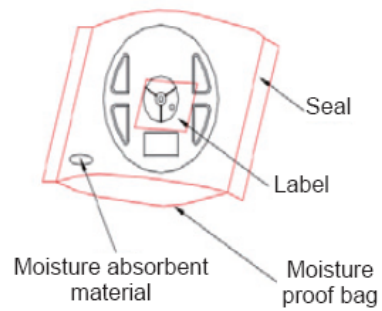


Figure 15. Federal 3535 Package



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## Revision History

Table 8. Revision history of Federal 3535 single color datasheet

Version	Description	Release Date
1	1. Establish datasheet	2011/05/16
2	1. Add the specification of EFER-1BE1 2. modified the mechanical dimensions 3. modified the table of absolute maximum ratings	2011/06/20
3	1. Update the Luminous Flux with bin group 2. Update the total pcs of packageing	2011/07/16
4	1.Add Product Packaging Information 2.Update Luminous Flux Characteristics on P.6	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](http://www.edison-opto.com)

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[www.edison-opto.com](http://www.edison-opto.com)

For general assistance please contact:  
[service@edison-opto.com.tw](mailto:service@edison-opto.com.tw)

For technical assistance please contact:  
[LED.Detective@edison-opto.com.tw](mailto:LED.Detective@edison-opto.com.tw)