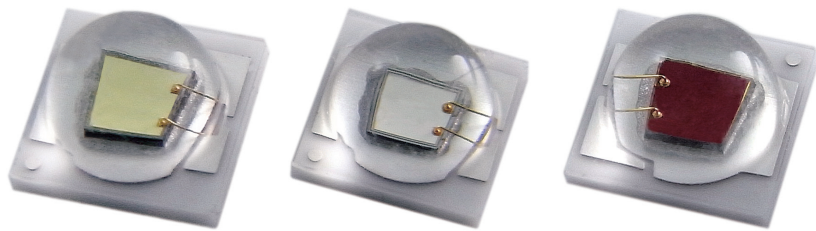


Federal Series

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

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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

<u>E F</u>		<u>E</u>	<u>X</u>	-	<u>1</u>	<u>B</u>	<u>E</u>	<u>1</u>	
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	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	-	-						

Dimensions

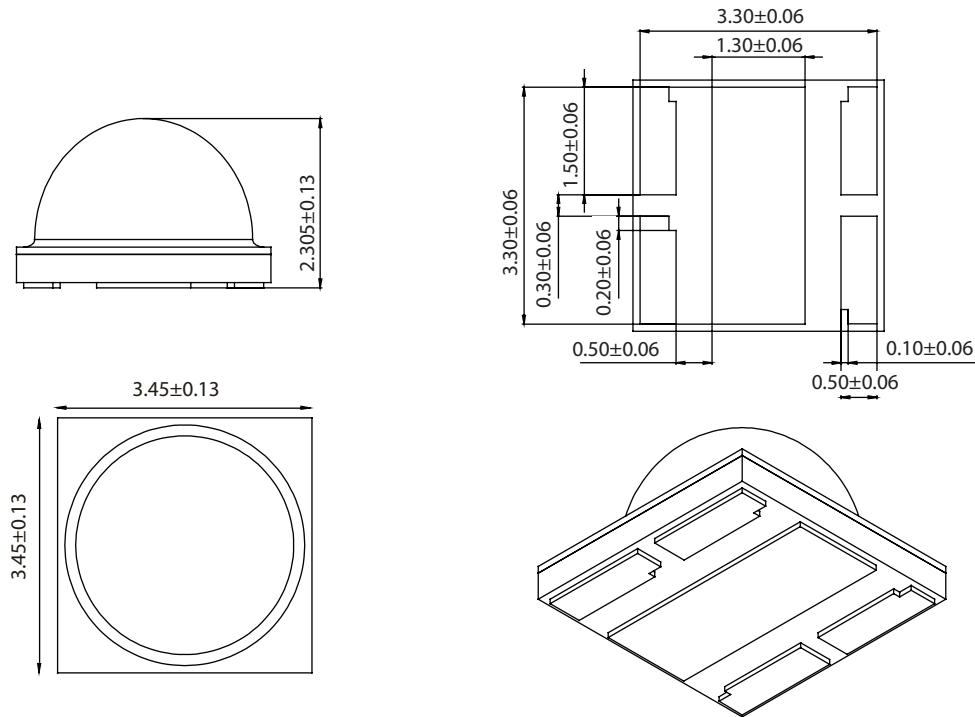


Figure 1. Federal 3535 single color Dimension

Notes:

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

Star PCB Type Dimension

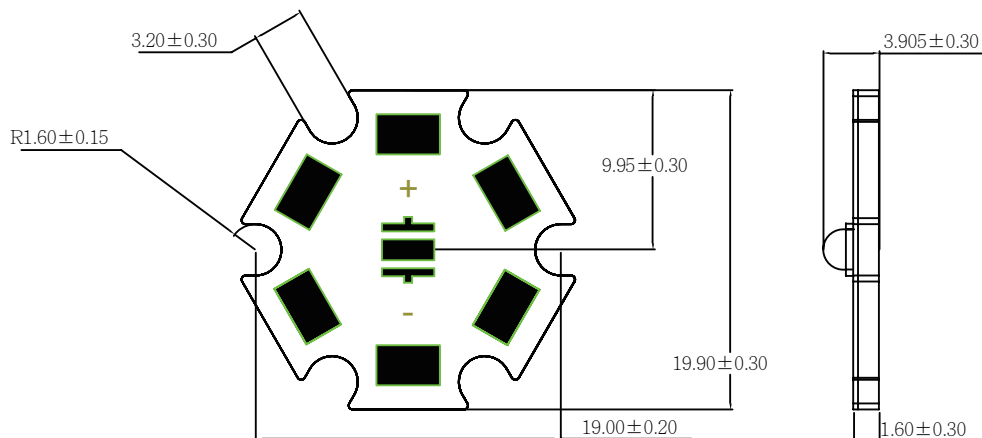
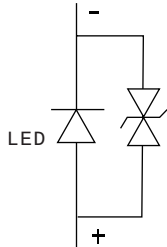


Figure 2. Federal 3535 Star PCB type Dimension

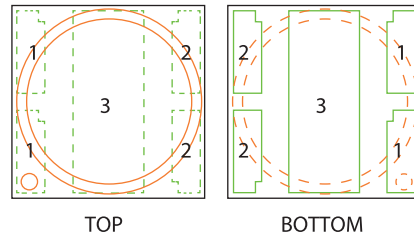
Notes:

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

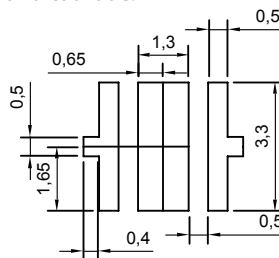


Figure 4. Federal 3535 single color solder pad

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 ^[1]	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 ^[2]	V_r	Note 2	V
LED Junction Temperature ^[3]	T_J	150 / 125 ^[4]	°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 Temperate	T_{sol}	260	°C

Notes:

- Maximum forward current for 1W and 3W are 350mA and 700mA respectively.
- LEDs are not designed to drive in reverse bias.
- Proper current derating must be observed to maintain junction temperature below the maximum.
- 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, $I_f=350\text{mA}$ and Thermal $=25^\circ\text{C}$

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
	EFEB-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 $\pm 10\%$.
3. Min luminous flux of 700 mA is only for reference.

Characteristics

Optical Characteristics

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

Part Name	Color	CCT/Wavelength (nm)			Viewing Angle (Degree)
		Min.	Typ.	Max.	
EFER-1BE1	Red	620	--	630	105
EFET-1BE1	True Green	520	--	535	110
EFEB-1BE1	Blue	460	--	470	110
EFEA-1BE1	Amber	585	--	595	105

Note:

1. Edison maintains a tolerance of $\pm 5\%$ on wavelength measurement.
2. Viewing angle is measured with accuracy of $\pm 10\%$

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% RH	168+5/-0	85°C / 85% RH

Characteristic Curve

Spectrum

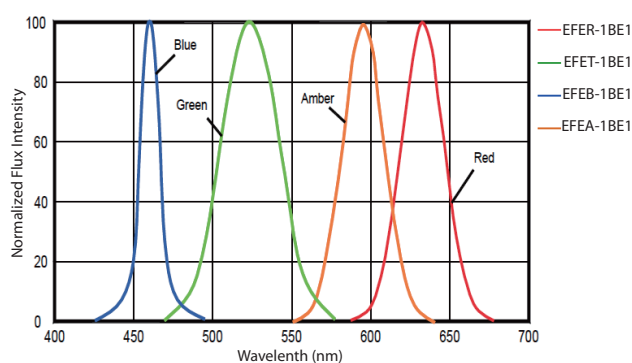


Figure 5. Color Spectrum for Federal 3535 single color at $T_j=25\text{ }^{\circ}\text{C}$

Radiation Diagram

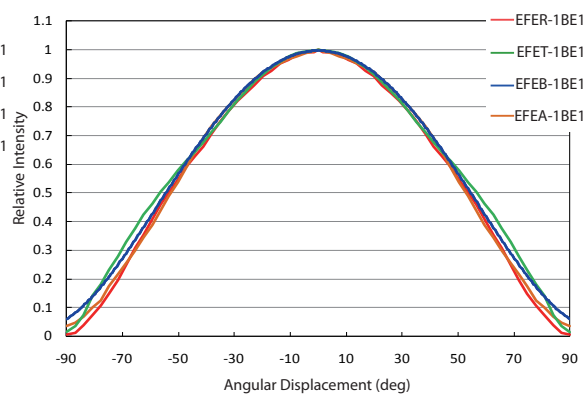


Figure 6. Radiation diagram.

Forward Voltage & Forward Current

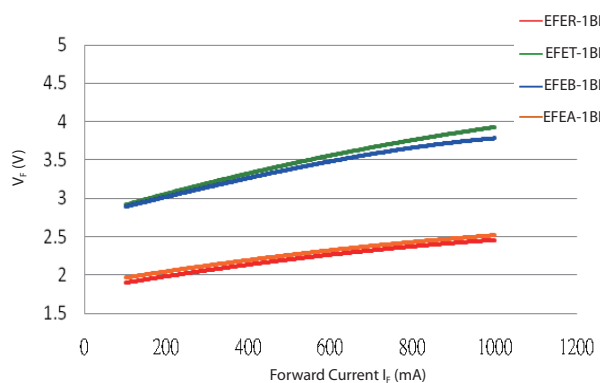


Figure 7. Forward voltage vs. forward current for Federal 3535 single color.

Luminous Flux & Forward Current

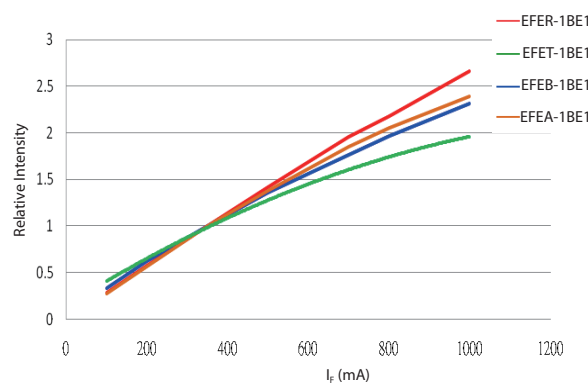


Figure 8. Relative luminous flux vs. forward current for Federal 3535 single color.

Wavelength & Forward Current

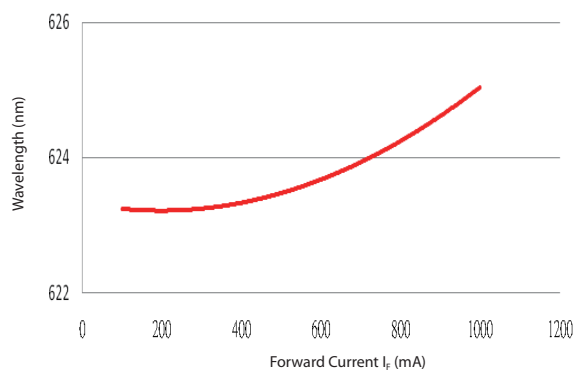


Figure 9. Wavelength vs. forward current for Federal 3535 single color Red.

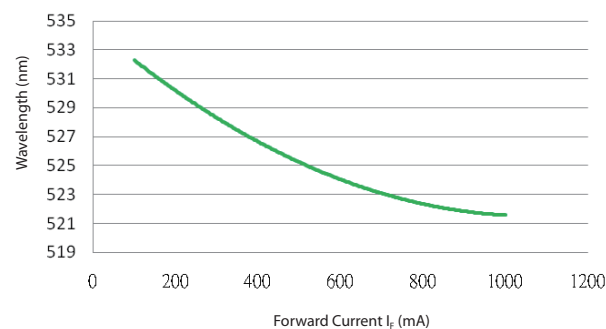


Figure 10. Wavelength vs. forward current for Federal 3535 single color True Green.

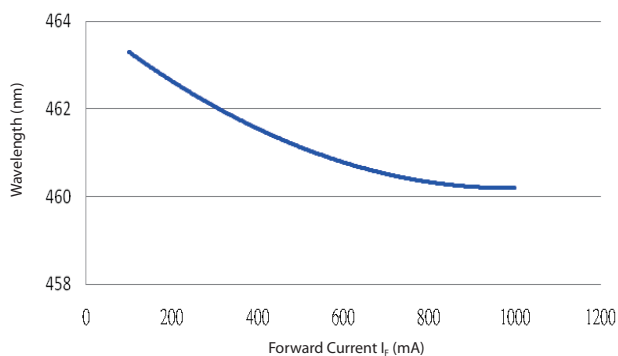


Figure 11. Wavelength vs. forward current for Federal 3535 single color Blue.

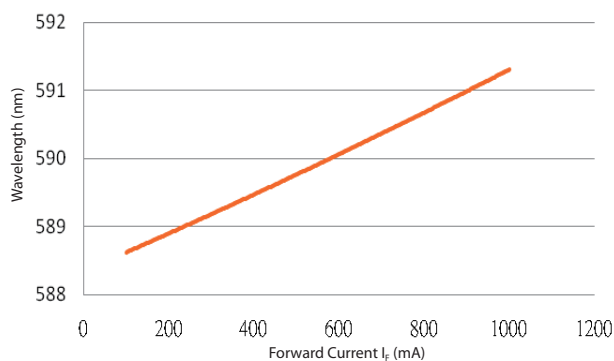


Figure 12. Wavelength vs. forward current for Federal 3535 single color Amber.

Luminous Flux & Junction Temperature

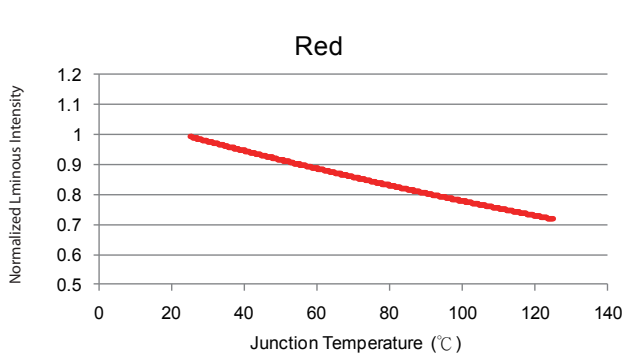


Figure 11. Normalized luminous intensity vs. Junction temperature for Federal 3535 single color Red.

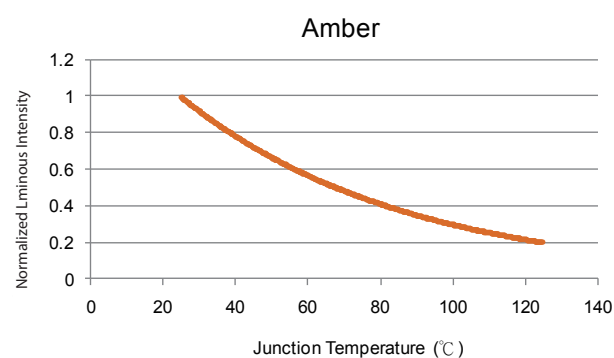


Figure 12. Normalized luminous intensity vs. Junction temperature for Federal 3535 single color Amber.

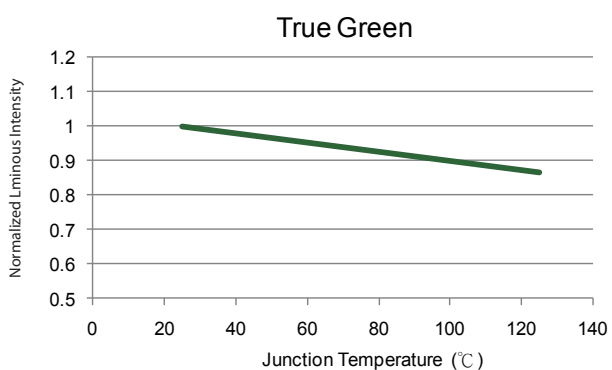


Figure 13. Normalized luminous intensity vs. Junction temperature for Federal 3535 single color True Green.

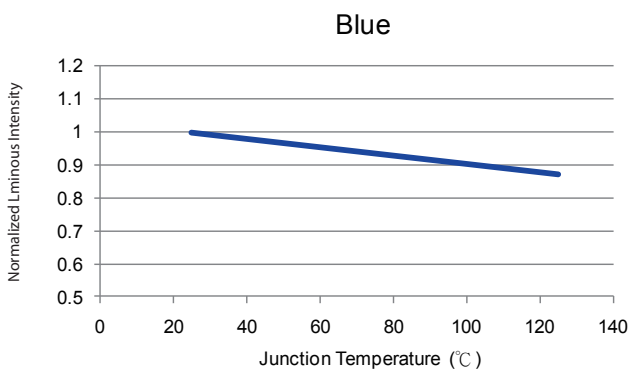
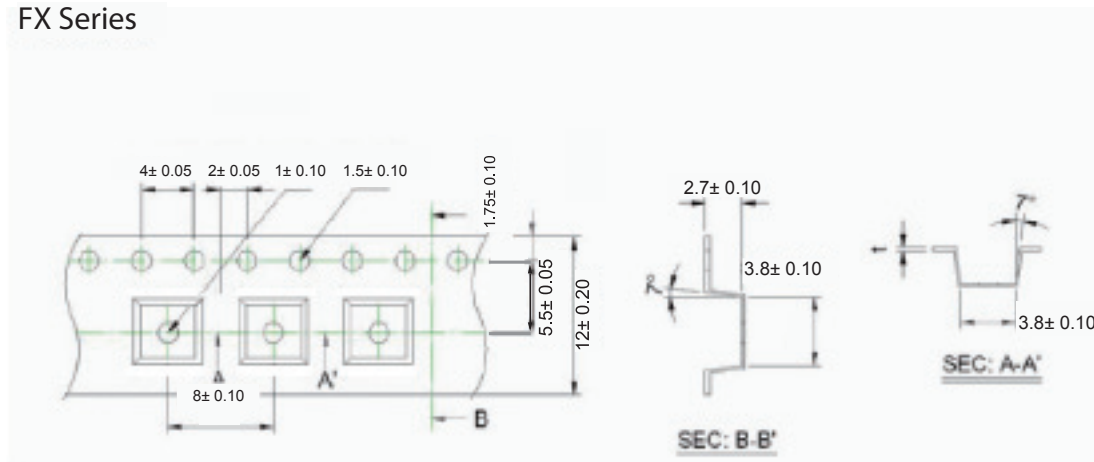


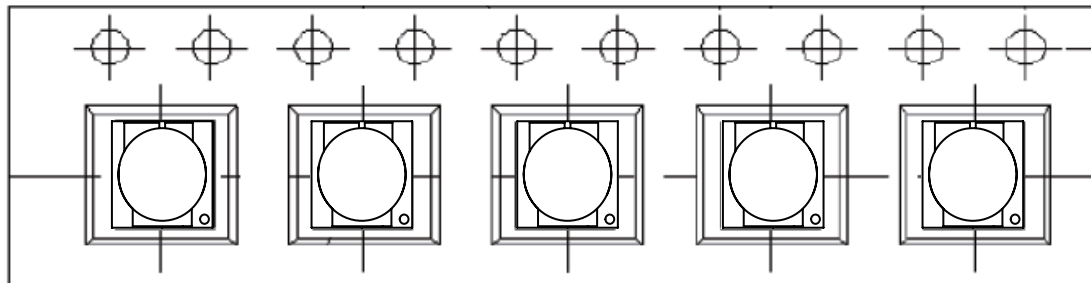
Figure 14. Normalized luminous intensity vs. Junction temperature for Federal 3535 single color Blue.

Product Packaging Information

FX Series



CATHODE SIDE



ANODE SIDE

Figure 15. 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

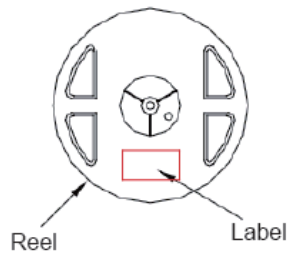


Figure 16. Taping reel dimensions

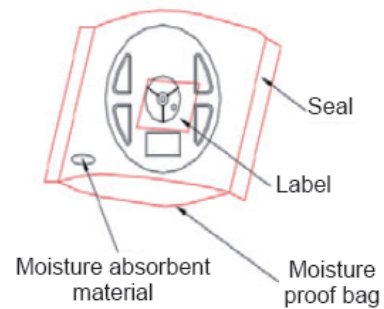


Figure 17. Federal 3535 Package

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	2012/01/10
5	1.Add the figure of Normalized luminous intensity vs. Junction temperature.	2012/06/15
6	1. Modified the radiation diagram 2. Update the viewing angle	2012/07/09

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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