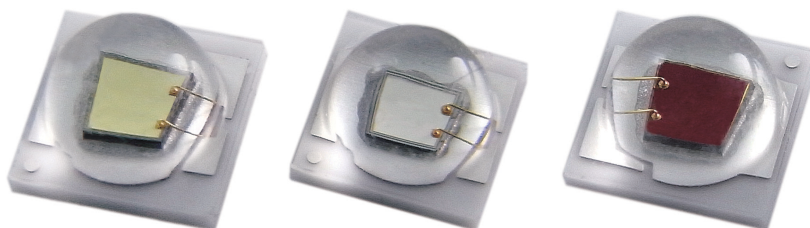


Federal 3535 Single Color Datasheet



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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<u>2</u>	<u>F</u>	<u>X 0</u>	<u>0 1</u>	<u>x X</u>	<u>0 0</u>	<u>F 0 2</u>	<u>x x x</u>		
X1	X2	X3	X4	X5	X6	X7	X8		
X1		X2		X3		X4		X5	
Type		Component		Series		Wattage		Color	
2	Emitter	F	Federal	X0	3535	01	1W	RX	Red
								TX	True Green
								BX	Blue
								AX	Amber
X6		X7		X8					
Internal code		PCB Board		Serial Number					
-	-	F02	3535	-	-				

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}	1000	mA
Transient Surge Voltage	-	8	V
Reverse Voltage ^[2]	V_R	Note 2	V
LED Junction Temperature ^[3]	T_J	125	°C
Operating Temperature	-	-40 ~ +85	°C
Storage Temperature	-	-40 ~ +125	°C
ESD Sensitivity (HBM)	-	8000	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.

Characteristics

Parameter	Symbol	Value	Units
Viewing Angle (Typ.)	$2\Theta_{1/2}$	R / A : 105 T / B : 110	Degree
Thermal resistance	-	10	°C/W
Wavelength	-	R : 620 - 630 T : 520 - 535 B : 455 - 470 A : 585 - 596	nm
JEDEC Moisture Sensitivity	-	Level 1 Floor Life Conditions: ≤30°C / 85% RH Soak Requirements(Standard) Time (hours): 168+5/-0 Conditions: 85°C / 85% RH	-

Notes:

1. Edison maintains a tolerance of ±1nm on wavelength measurement.
2. Viewing angle is measured with accuracy of ±10%.

Luminous Flux Characteristic

Luminous Flux Characteristics, $I_f=350\text{mA}$ and $T_j=25^\circ\text{C}$

Color	Group	Min. Luminous Flux@350mA (lm)	Min. Luminous Flux@700mA (lm)	Order Code
Red	R1	39.4	75	2FX001RX00F02001
	R2	45.3	85	
	S0	51.2	100	
True Green	T0	66.5	105	2FX001TX00F02001
	U0	86.5	140	
	V0	110	170	
Blue	N0	17.9	30	2FX001BX00F02001
	P0	23.3	40	
	Q0	30.3	52	
Amber	R1	39.4	75	2FX001AX00F02001
	R2	45.3	85	
	S0	51.2	100	
	T0	66.5	125	

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.

Voltage Bin Structure

Red, Amber

Group	Min. Voltage (V)	Max. Voltage (V)
U03	1.6	1.9
U04	1.9	2.2
U05	2.2	2.5
V00	2.5	2.8

True Green, Blue

Group	Min. Voltage (V)	Max. Voltage (V)
V01	2.8	3.1
V02	3.1	3.4
V03	3.4	3.7
V04	3.7	4.0

Note:
Forward voltage measurement allowance is $\pm 0.06V$.

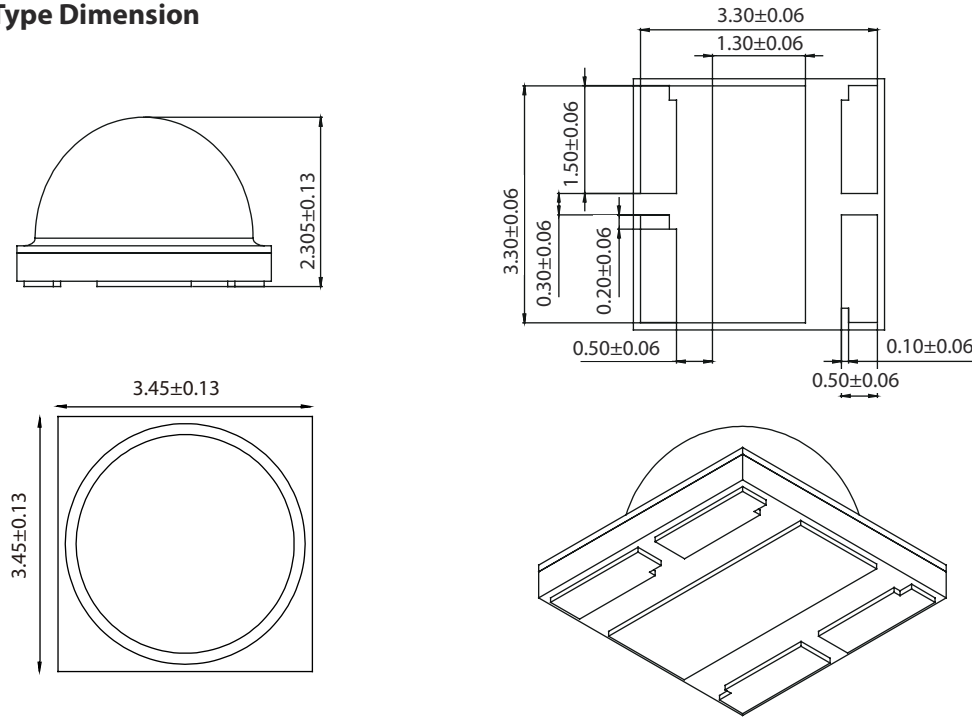
Wavelength Bin Structure

Color	Group	Min. Wd (nm)	Max. Wd (nm)
Red	RX0	620	630
True Green	TW0	520	525
	TX0	525	530
	TY0	530	535
Blue	BV0	455	460
	BW0	460	465
	BX0	465	470
Amber	AX0	585	587.5
	AY0	587.5	590
	AZ0	590	596

Note:
Dominant wavelength measurement allowance is $\pm 1nm$.

Mechanical Dimensions

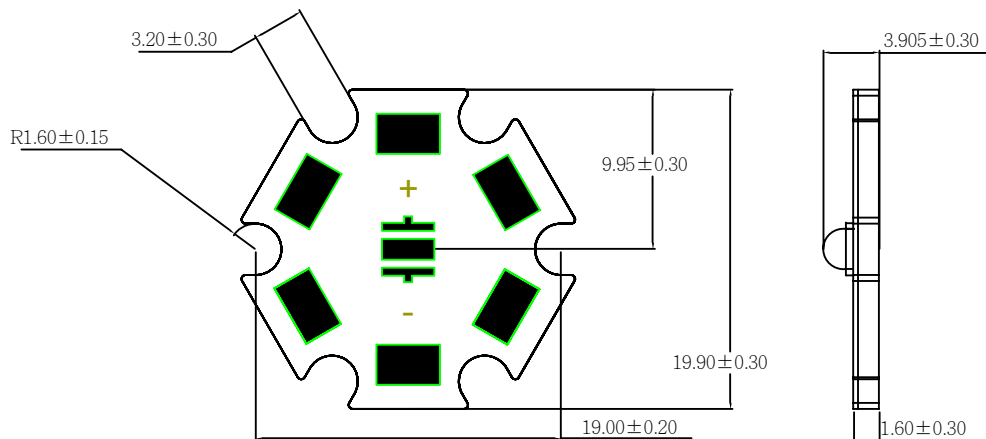
Emitter Type Dimension



Notes:

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

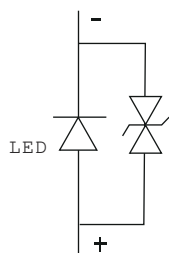
Star PCB Type Dimension



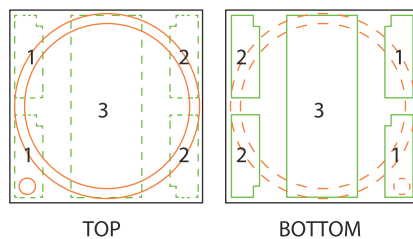
Notes:

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

Circuit



PCB Layout

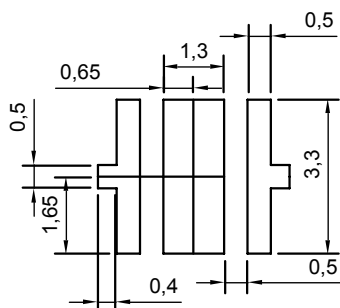


Pad Configuration

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

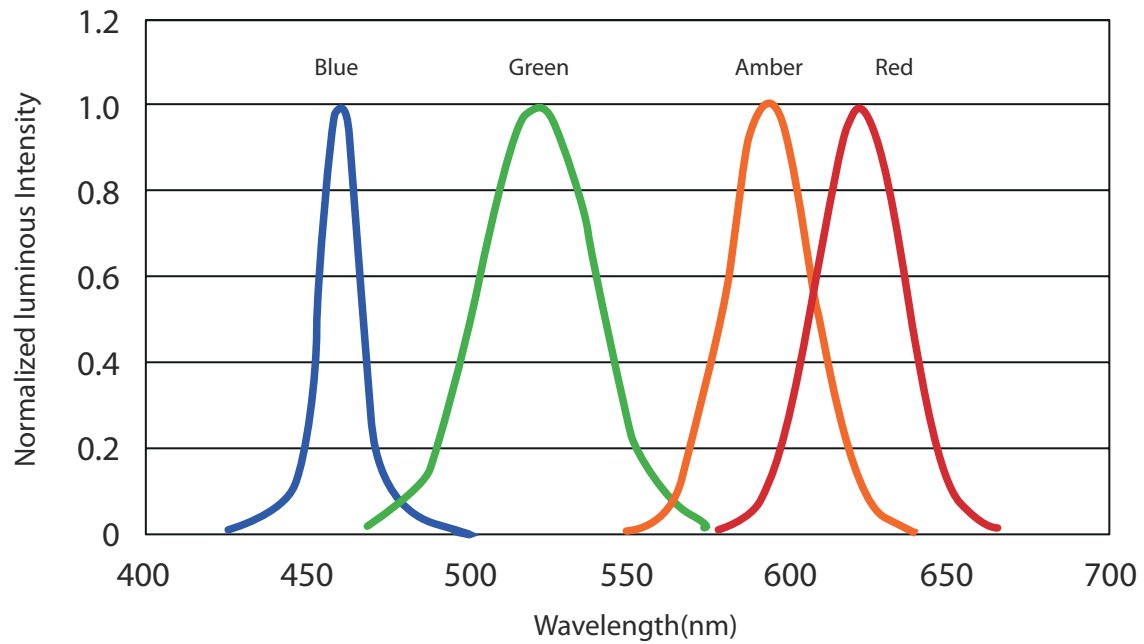
Note:
The thermal pad is electrically isolated from anode and cathode.

Solder Pad

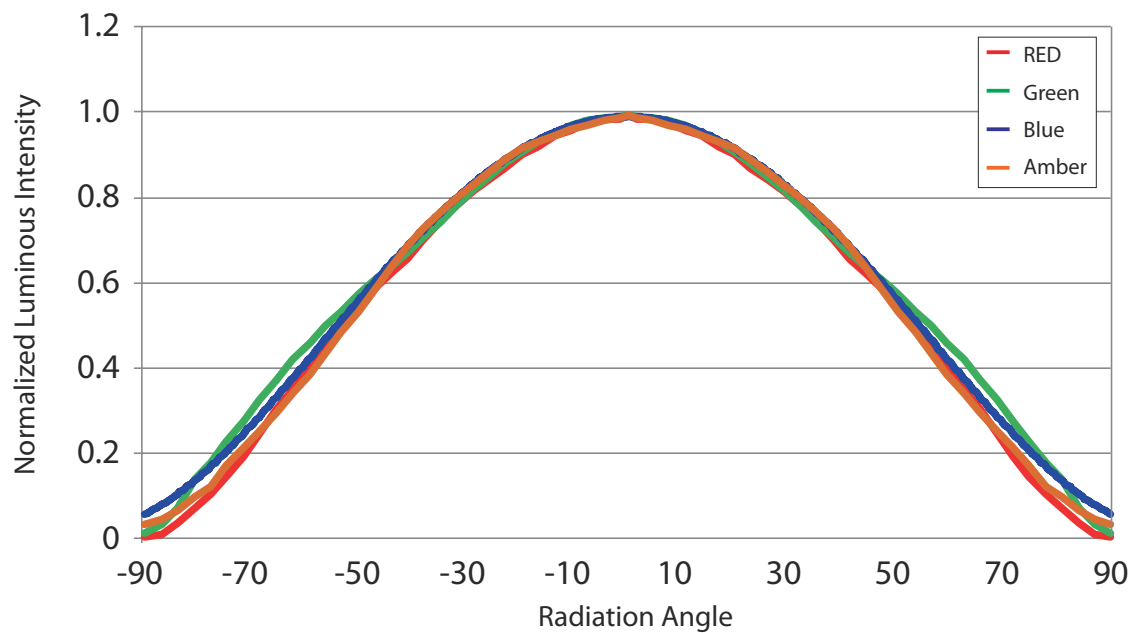


Characteristic curve

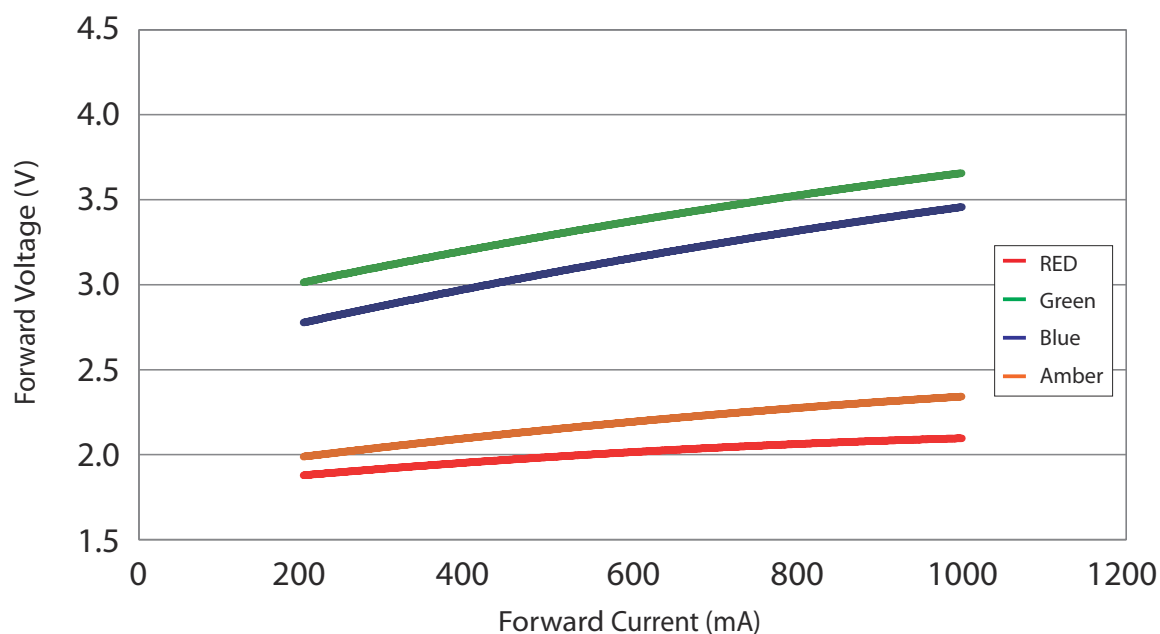
Color Spectrum



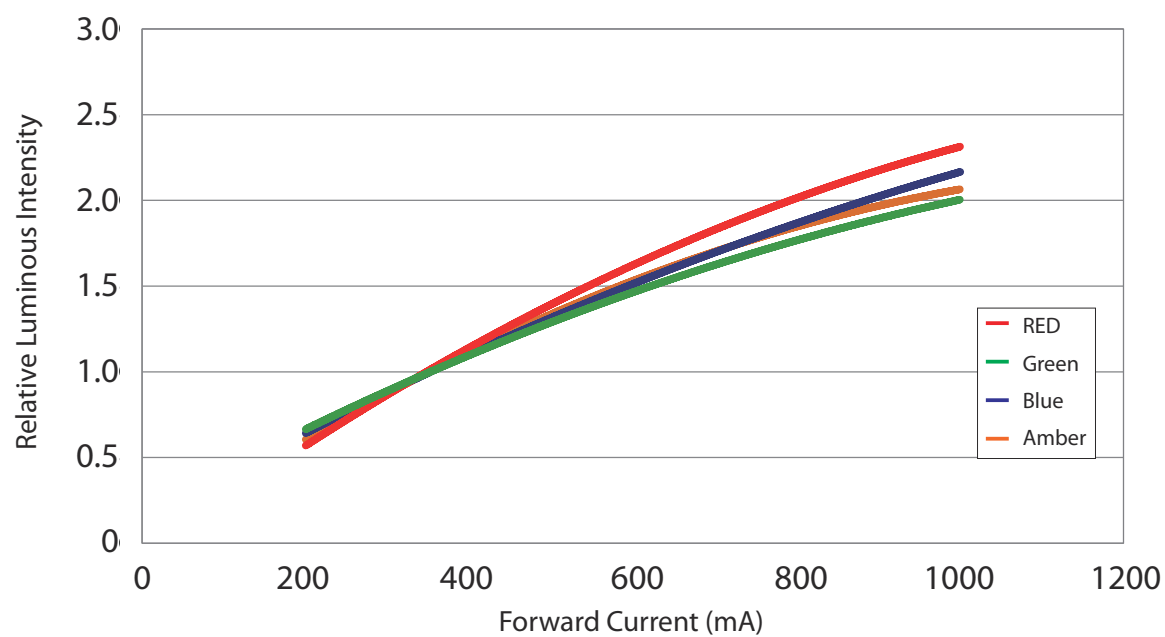
Beam Pattern



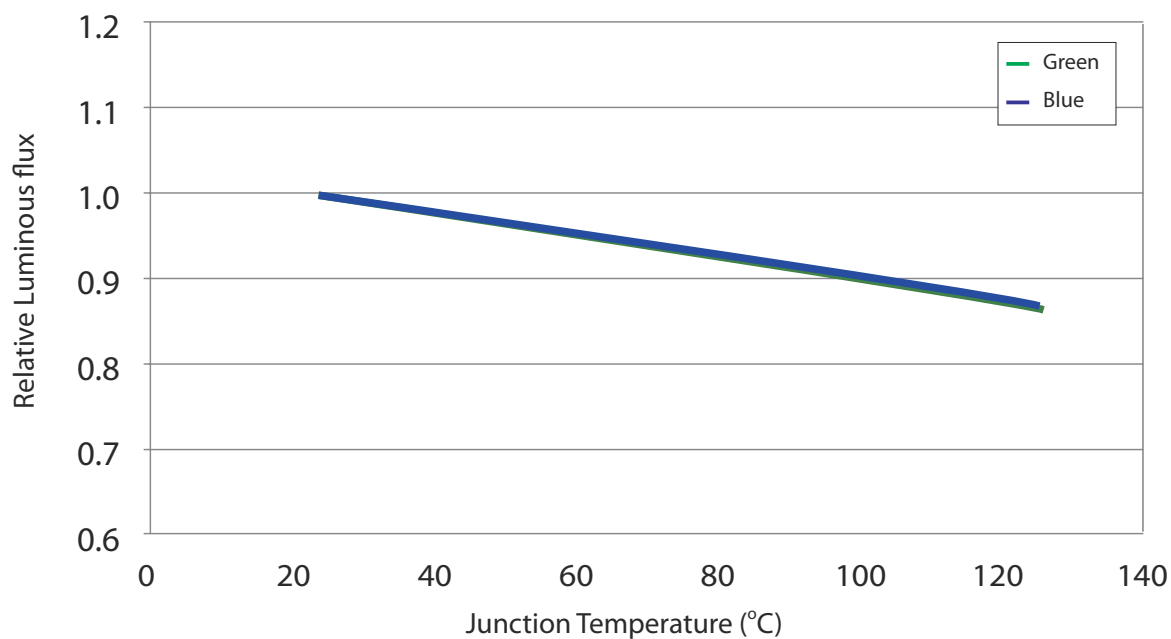
Forward Current vs. Forward Voltage



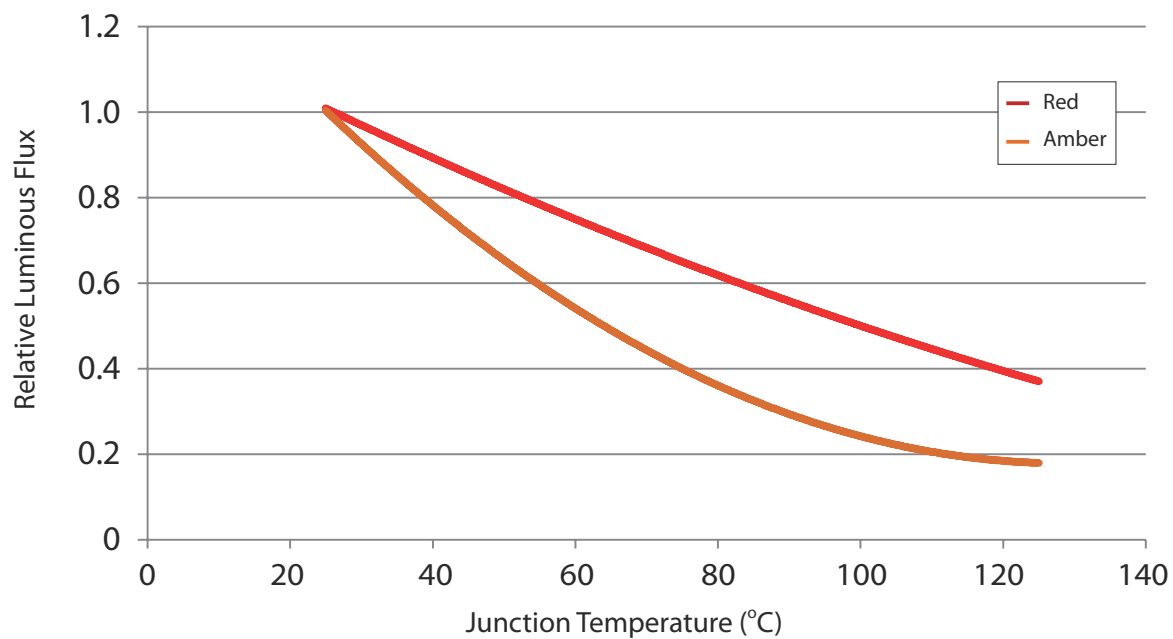
Relative Luminous Intensity vs. Forward Current



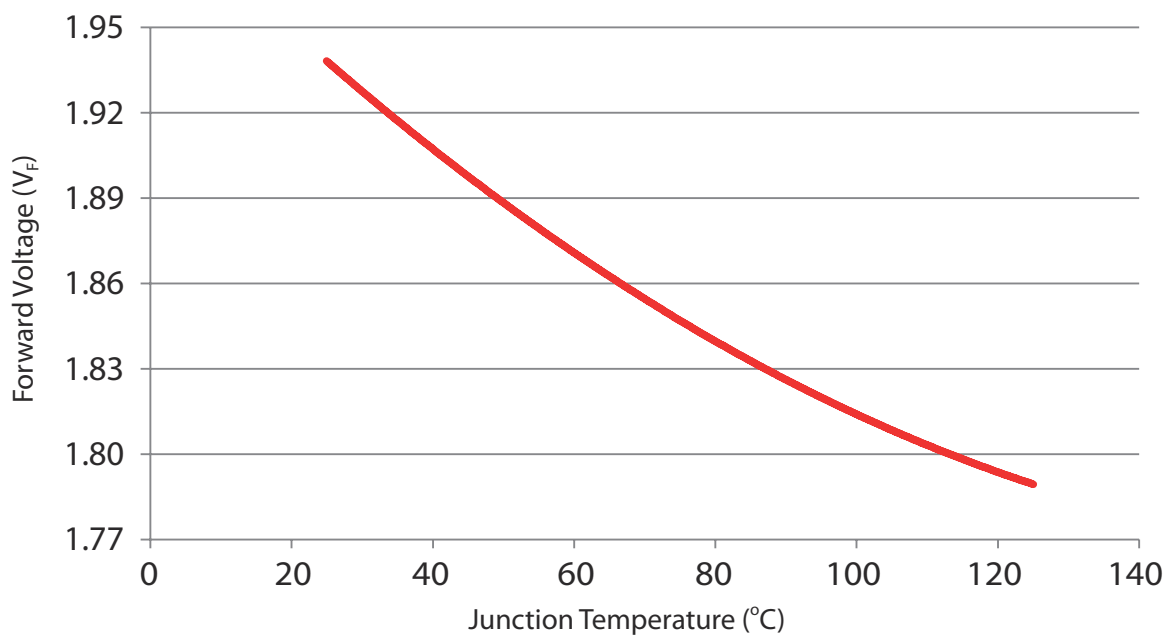
Relative Luminous Flux vs. Junction Temperature (Blue, Green)



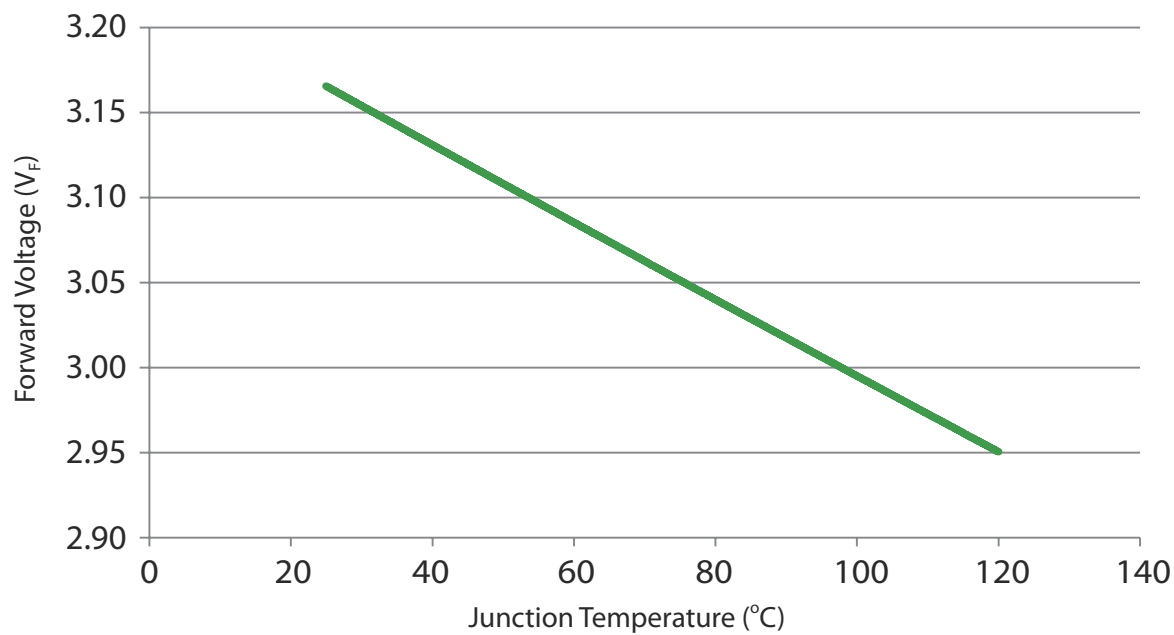
Relative Luminous Flux vs. Junction Temperature (Red, Amber)



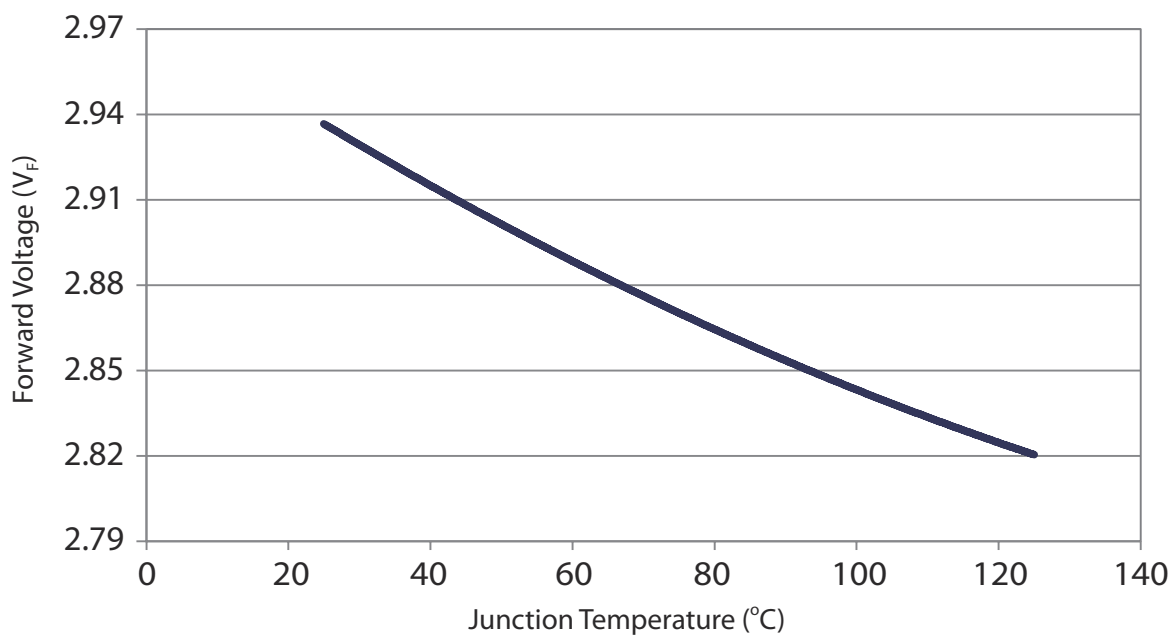
Forward Voltage vs. Junction Temperature (Red)



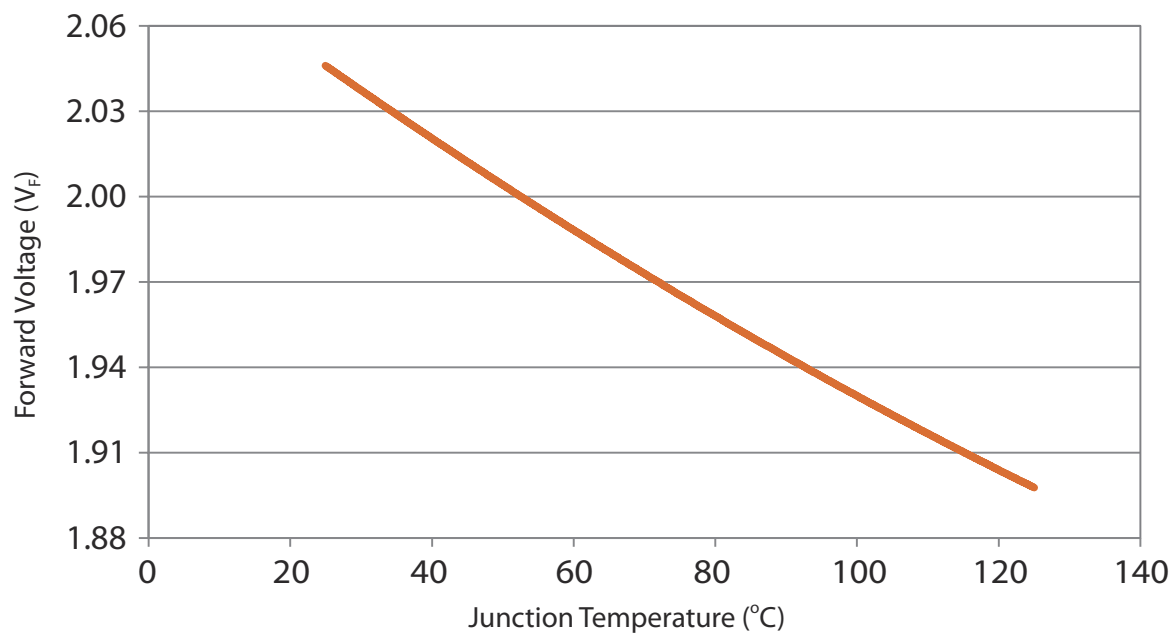
Forward Voltage vs. Junction Temperature (True Green)



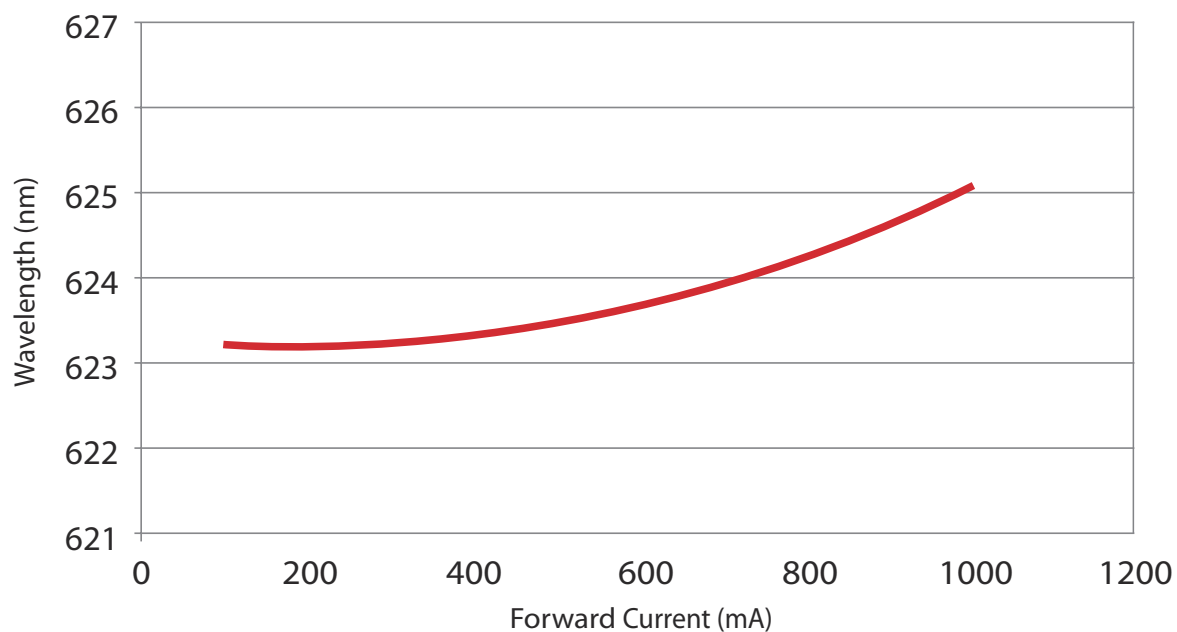
Forward Voltage vs. Junction Temperature (Blue)



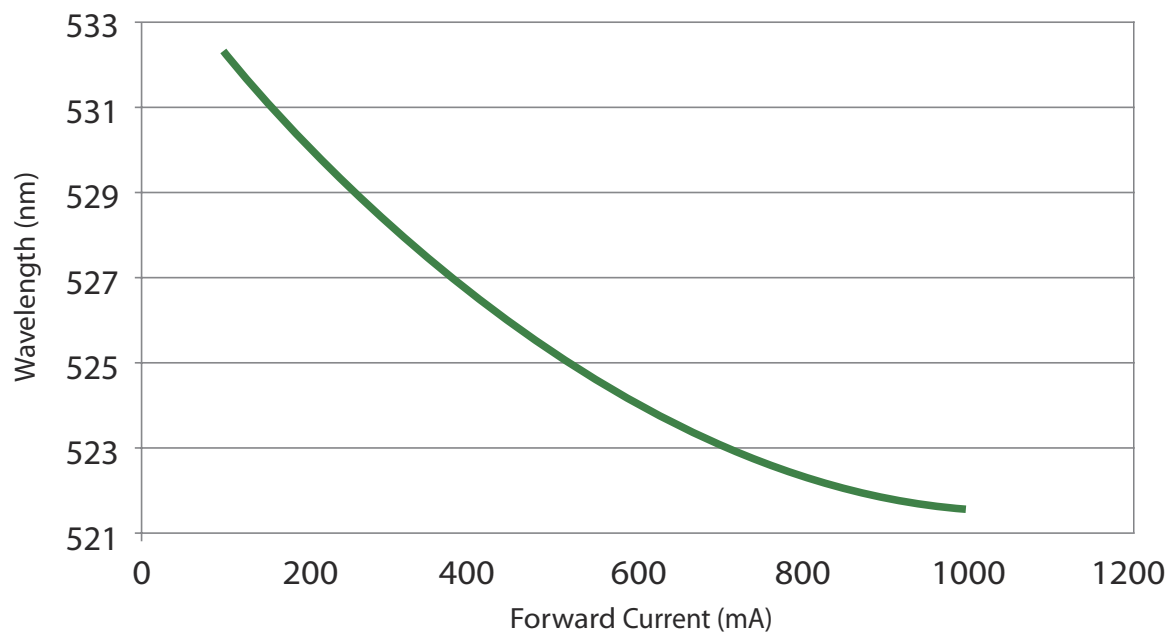
Forward Voltage vs. Junction Temperature (Amber)



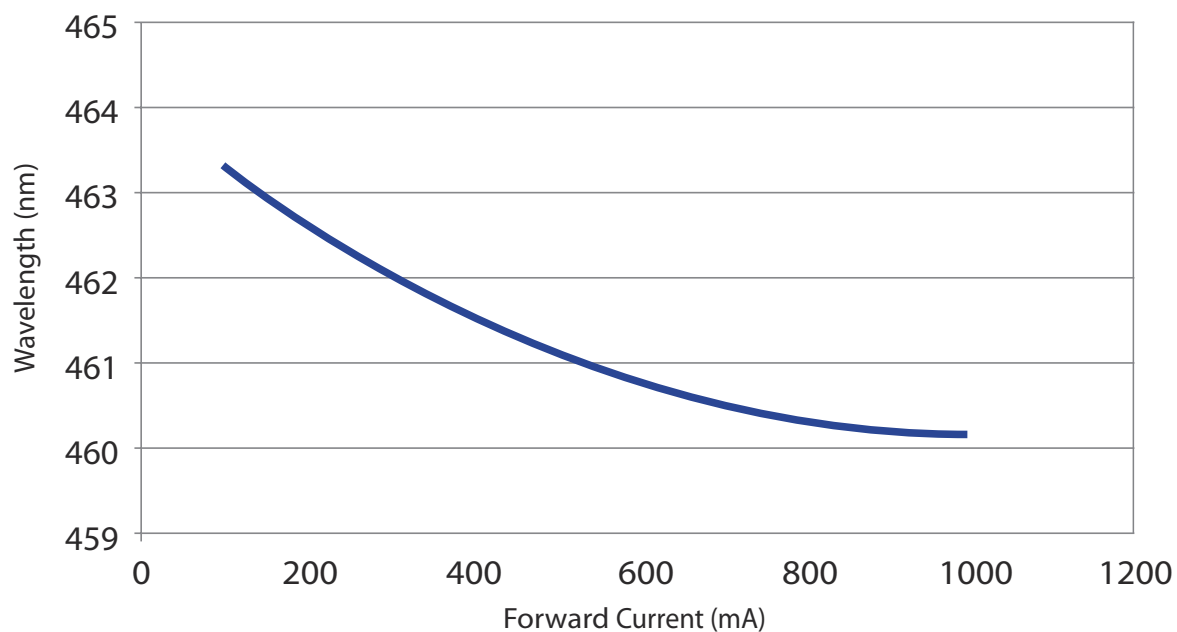
Wavelength vs. Forward Current (Red)



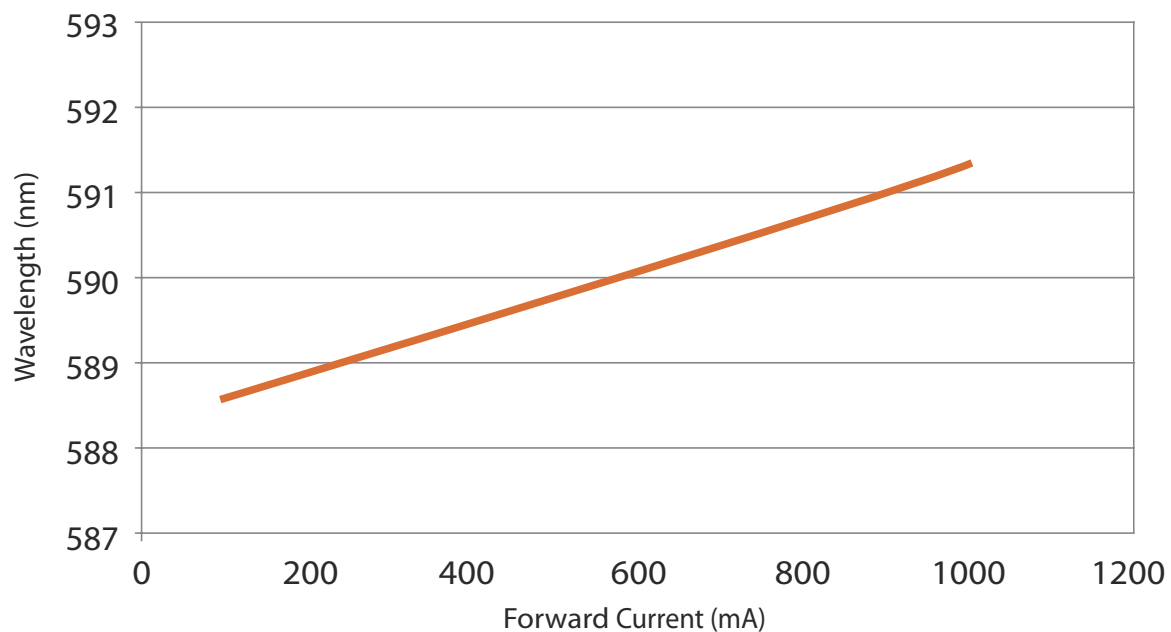
Wavelength vs. Forward Current (True Green)



Wavelength vs. Forward Current (Blue)

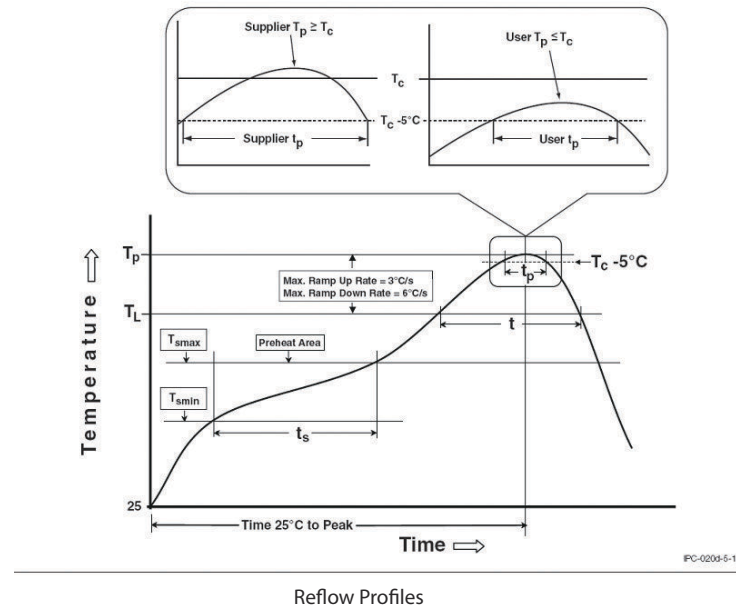


Wavelength vs. Forward Current (Amber)



Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Reflow Profiles

Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak	
Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.
Liquidous temperature (T_L)	217 °C
Time at liquidous (t_L)	60-150 seconds
Peak package body temperature (T_p)*	255 °C ~260 °C *
Classification temperature (T_c)	260 °C
Time (t_p)** within 5 °C of the specified classification temperature (T_c)	30** seconds
Average ramp-down rate (T_p to T_{smax})	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Notes:

- * Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
- ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins ≤ 10 sec	100 Cycle
3	Resistance to Soldering Heat	T _{SOL} =260°C, 30 sec	3 times
4	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
5	High-Temperature Storage	T _A =100°C	1,000 hrs
6	Humidity Heat Storage	T _A =85°C RH=85%	1,000 hrs
7	Low-Temperature Storage	T _A =-40°C	1,000 hrs
8	Operation Life test	25°C	1,000 hrs
9	High Temperature Operation Life test	85°C	1,000 hrs
10	High Humidity Heat Life Test	85°C, 85%RH	1,000 hrs
11	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

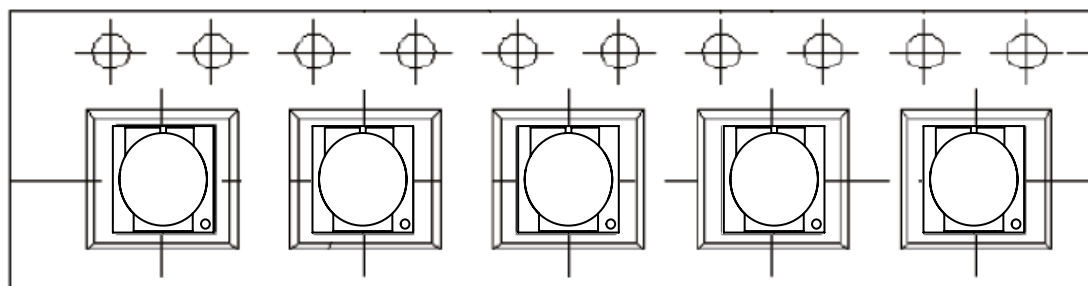
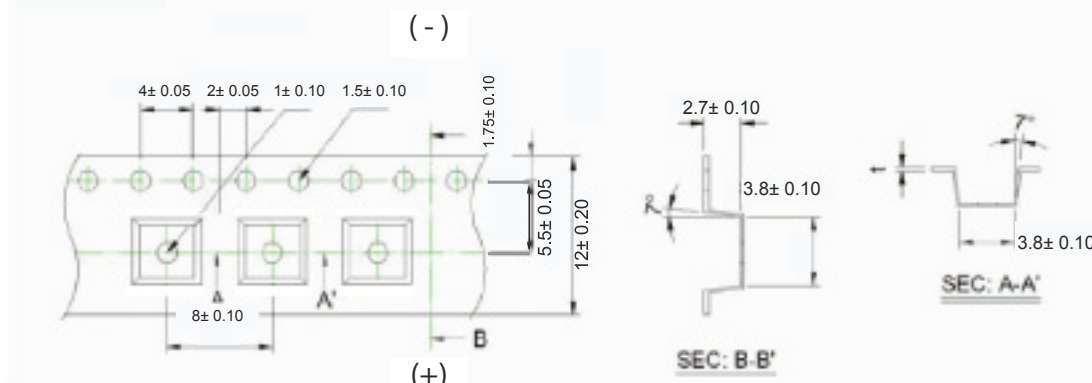
Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μ A
Resistance to Soldering Heat	No dead lamps or visual damage	

Cautions

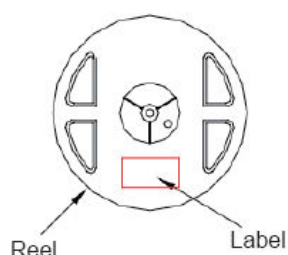
LED avoids being stored and lighted in the environment containing sulfur. Some materials, such as seals, printing ink, enclosure and adhesives, may contain sulfur, avoiding the exposure in acid or halogen environment.

Product Packaging Information

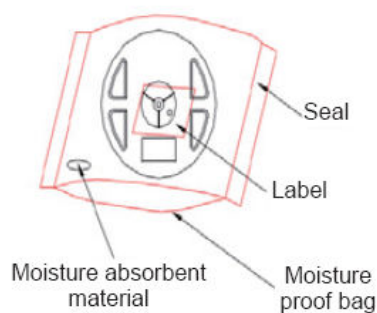
FX Series



ANODE SIDE



Taping reel dimensions



Federal 3535 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

Revision History

Versions	Description	Release Date
1	Establish order code information	2012/12/19
2	Add the Characteristic curve	2013/02/27
3	1. Revise the tolerance of wavelength measurement. 2. Add Reflow profile	2013/12/06
4	1. Add Reliability & Reflow Profile 2. Add Luminous Flux Characteristic (Amber)	2014/08/26
5	1. Add Voltage BIN Structure 2. Add Color BIN Code 3. Revise Luminous flux characteristic	2015/01/21
6	Update luminous flux characteristic	2015/05/27
7	1. Revise characteristic curve 2. Correct the value of wavelength 3. Update Luminous flux characteristic	2016/11/14
8	Revise Characteristic curve	2017/01/06
9	1. Update Green & Amber Wavelength BIN Structure 2. Add the cautions of reliability 3. Revise Max. operating temperature	2017/07/19

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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