DATASHEET

EVERLIGHT AUTOMOTIVE

EL MULTI COLOR TOP VIEW

3735-SRPA3501H-AM

Preliminary

Features

Package：PLCC 4 package
Typ. Luminous Flux Super Red：17 lm @ 150mA
Typ. Luminous Flux PC Amber：56 lm @ 350mA
Viewing angle：120°
ESD：8KV
MSL：2
Qualifications：According to AEC-Q102
Compliance with RoHS & REACH
Compliance Halogen Free. (Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)
Sulfur robustness

Applications

Automotive Exterior Lighting

Contents

1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition[1]
Forward Current	Super Red	I_F	20	150	200	mA	---
	PC Amber	I_F	40	350	400	mA	---
Luminous Flux[2][3]	Super Red	Φ_v	10	17	23	lm	I_F=150mA
	PC Amber	Φ_v	45	56	70	lm	I_F=350mA
Forward Voltage[4][5]	Super Red	V_F	1.75	2.40	3.00	V	I_F=150mA
	PC Amber		3.25	3.40	4.00	V	I_F=350mA
Viewing Angle	Super Red	ϕ	---	120	---	deg	I_F=150mA
	PC Amber						I_F=350mA
Dominant Wavelength	Super Red	λ_d	627	630	633	nm	I_F=150mA
Chromaticity Coordinates[6]	PC Amber	CIE $_x$	---	0.570	---	---	I_F=350mA
		CIE $_y$	---	0.420	---		
Thermal Resistance (Junction to Solder)	SR / PA	$R_{th\ JS\ real}$	---	40	---	K/W	I_F=350mA
		$R_{th\ JS\ el}$	---	30	---		

Notes:

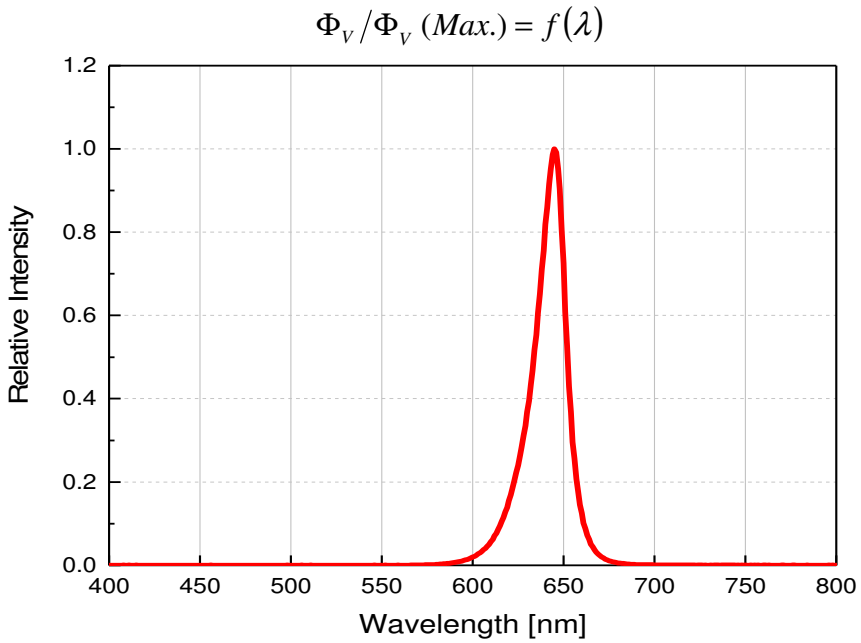
1. Forward conditon by each of LED.
2. Luminous flux measurement tolerance: ±8%.
3. The data of luminous flux measured at thermal pad=25℃
4. Forward voltage measurement tolerance: ±0.05V
5. The Vf range shown in the table above indicates 99% output.
6. Tolerance of Chromaticity coordinates x,y : ±0.005

2. Absolute Maximum Ratings

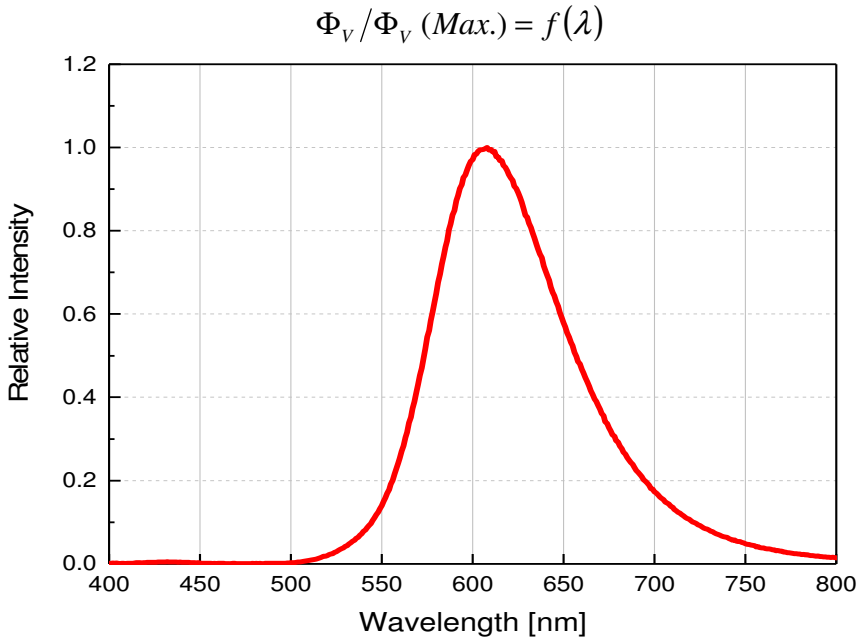
Parameter		Symbol	Ratings	Unit
Power Dissipation	Super Red	P_d	600	mW
	PC Amber		1600	
Forward Current	Super Red	I_F	200	mA
	PC Amber		400	
Reverse Voltage		V_R	Not designed for reverse operation	V
Junction Temperature		T_J	150	℃
Operating Temperature		T_{opr}	-40 ~ +125	℃
Storage Temperature		T_{stg}	-40 ~ +125	℃
ESD Sensitivity (R=1.5kΩ, C= 100pF)		ESD_{HBM}	8	KV
Soldering Temperature		Reflow	260℃ for 30sec	℃

3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution @ T_S = 25℃、I_F = 150mA (SR)

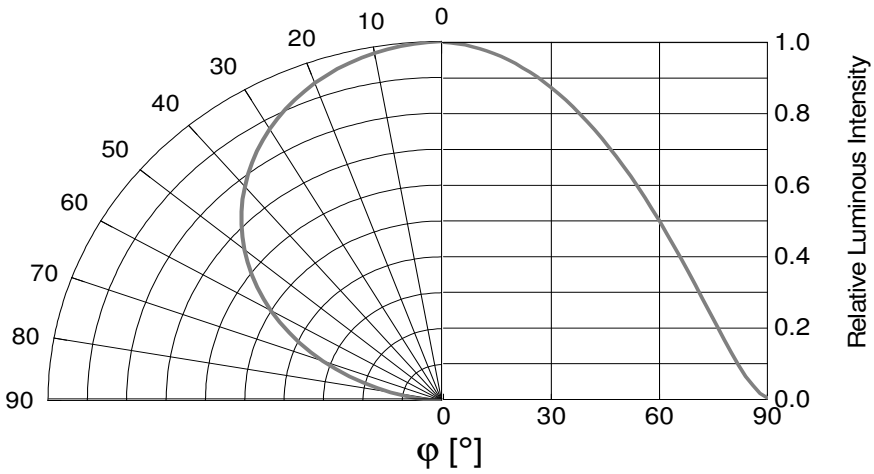


Wavelength Characteristics Relative Spectral Distribution @ T_S = 25℃、I_F = 350mA (PA)



Typical Diagram Characteristics of Radiation (SR / PA)

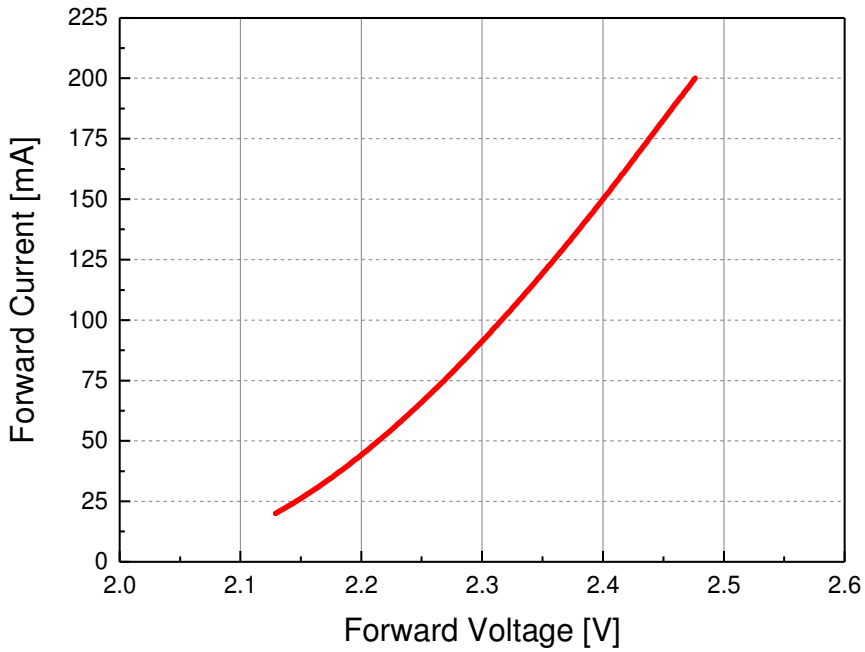
$$\Phi_V/\Phi_V(0^\circ) = f(\varphi)$$



Notes:

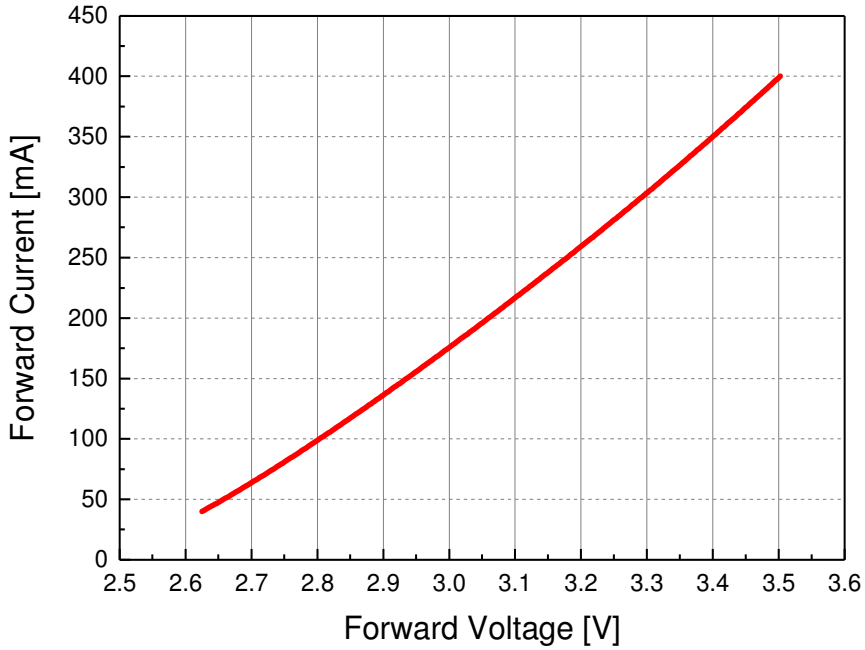
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is ± 5°

Forward Current vs. Forward Voltage @ T_S = 25℃ (SR)



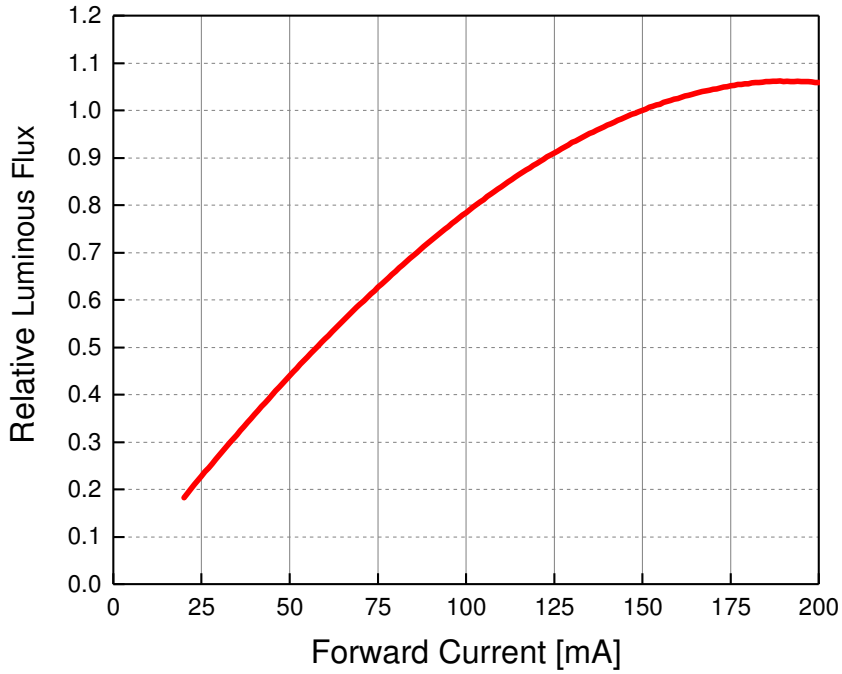
Forward Current vs. Forward Voltage @ Ts = 25℃ (PA)

$$I_F = f(V_F)$$



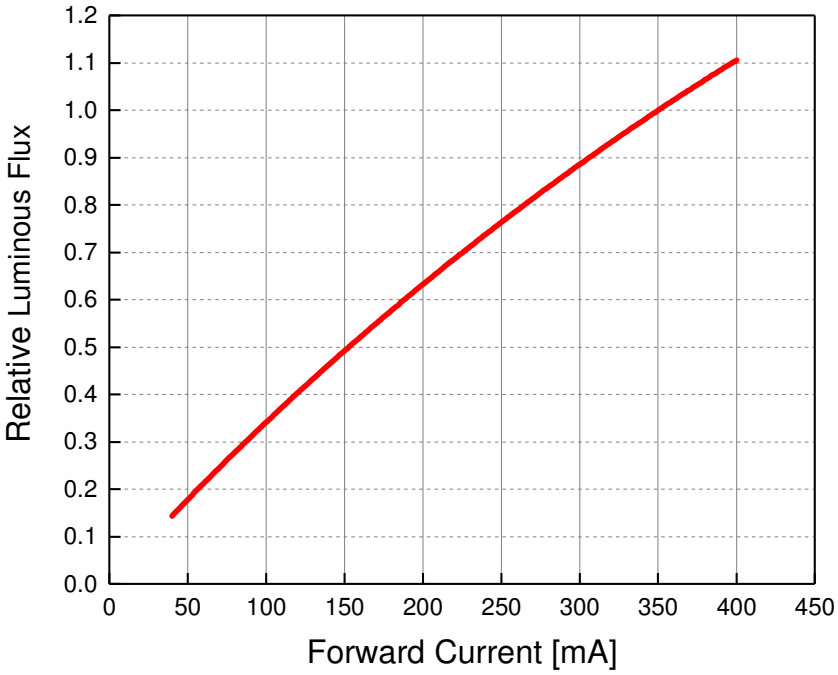
Relative Luminous Flux vs. Forward Current @ Ts = 25℃ (SR)

$$\Phi_V/\Phi_V(150mA) = f(I_F)$$



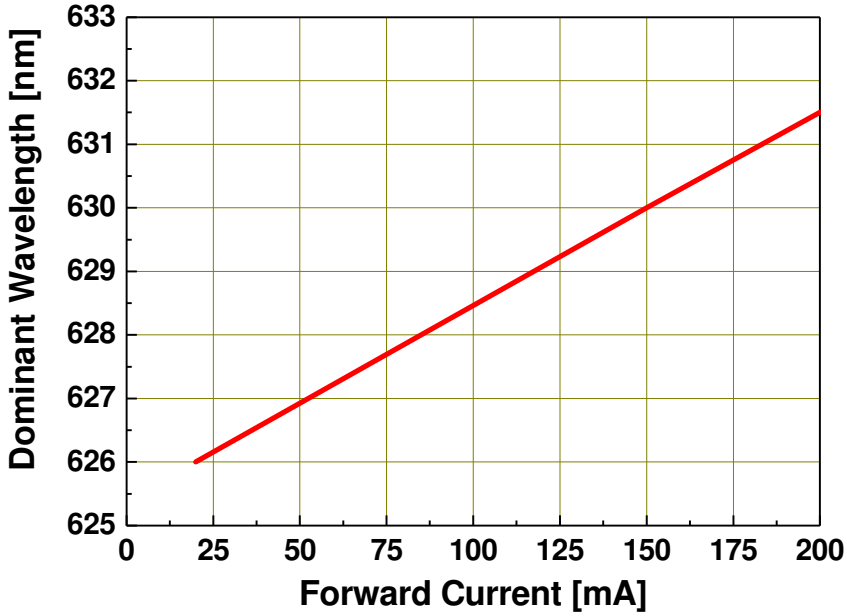
Relative Luminous Flux vs. Forward Current @ Ts = 25℃ (PA)

$$\Phi_V/\Phi_V(350mA) = f(I_F)$$

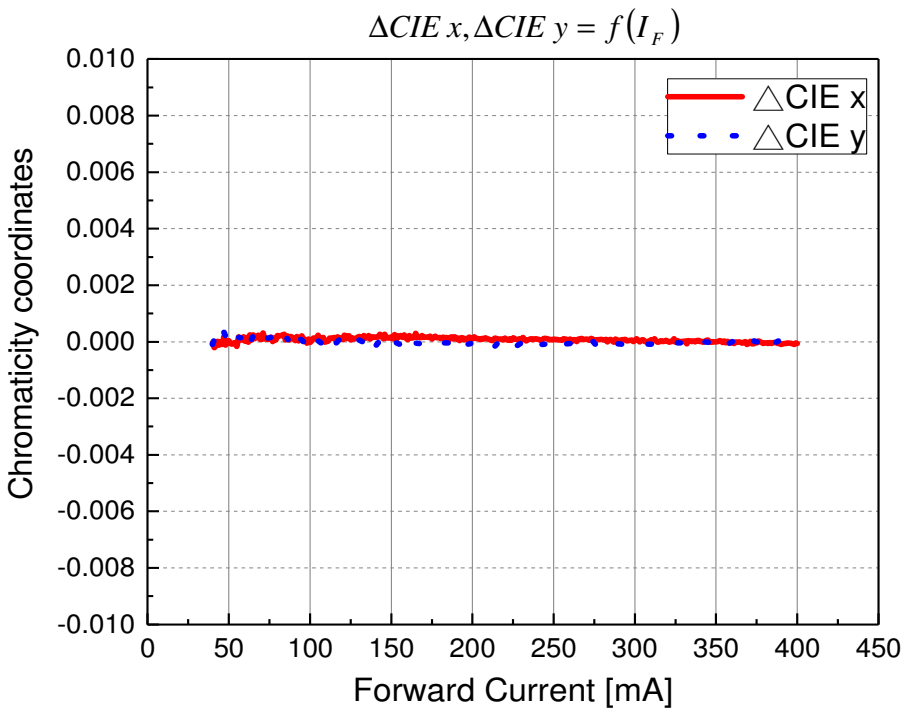


Dominant Wavelength vs. Forward Current @ Ts = 25℃ (SR)

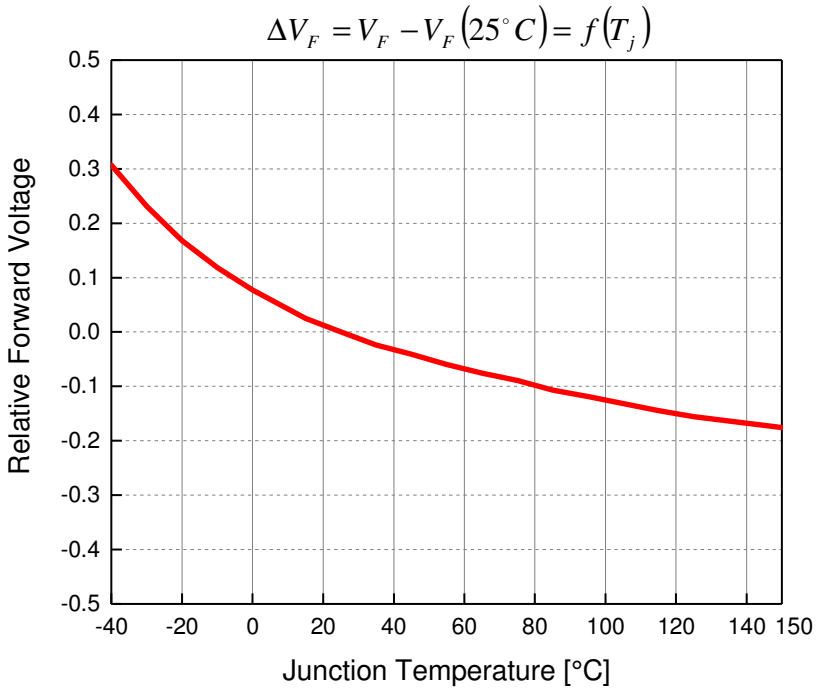
$$\lambda_d = f(I_F)$$



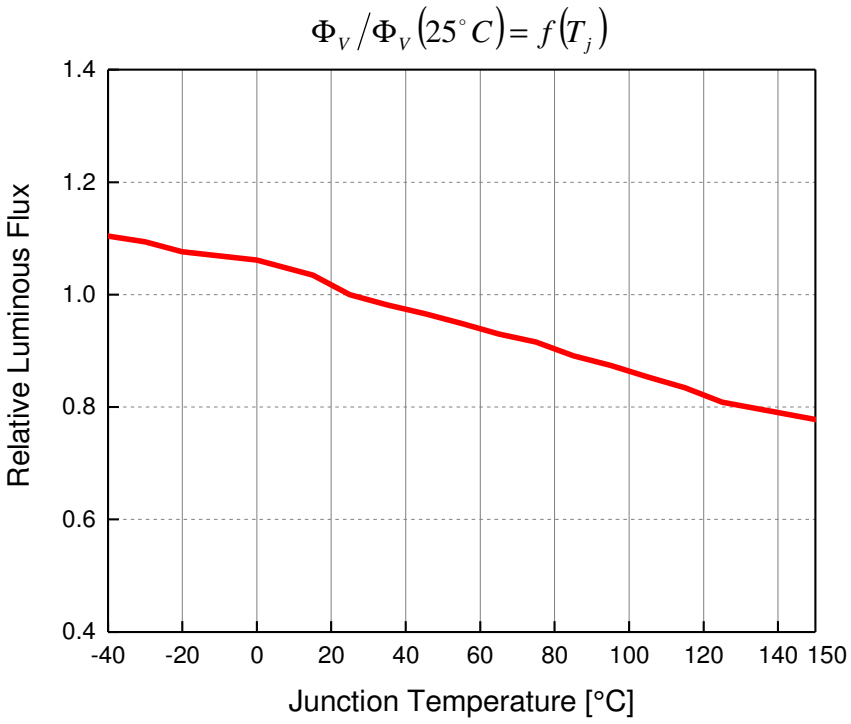
Chromaticity Coordinates vs. Forward Current @ T_S = 25℃ (PA)



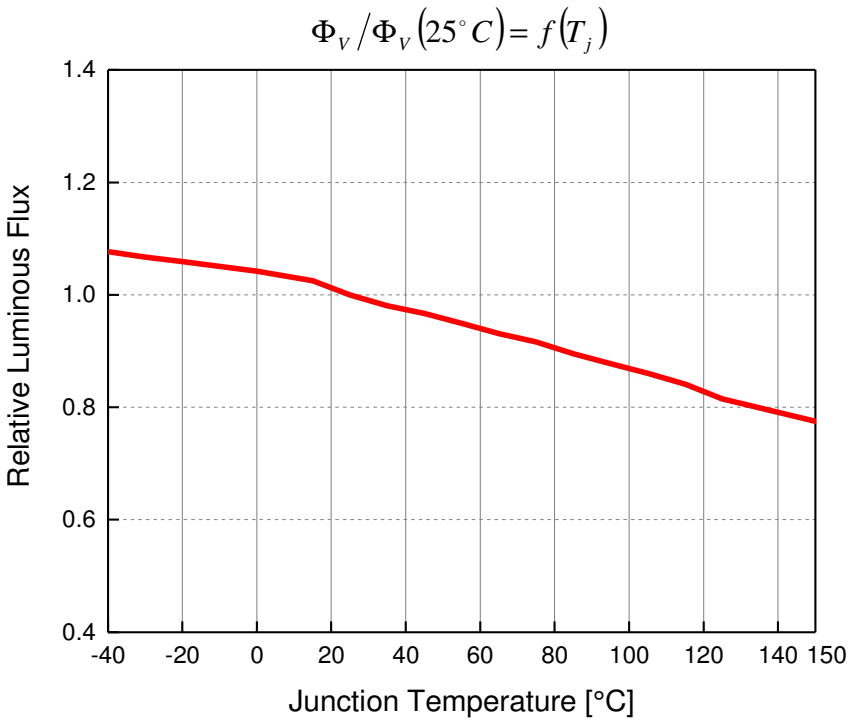
Relative Forward Voltage vs. Junction Temperature @ I_F = 350mA (SR / PA)



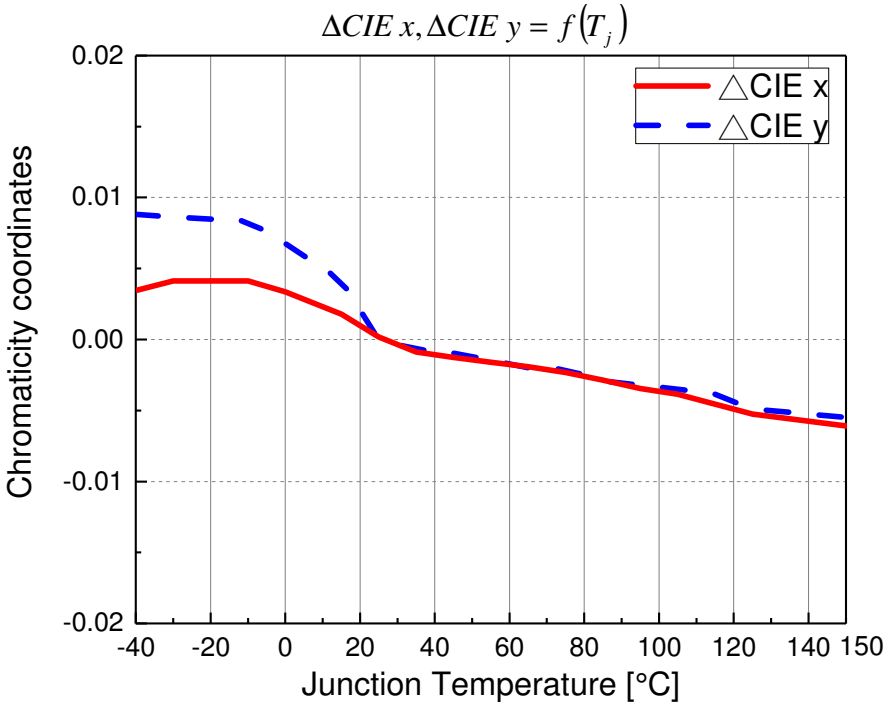
Relative Luminous Flux vs. Junction Temperature @ I_F = 150mA (SR)



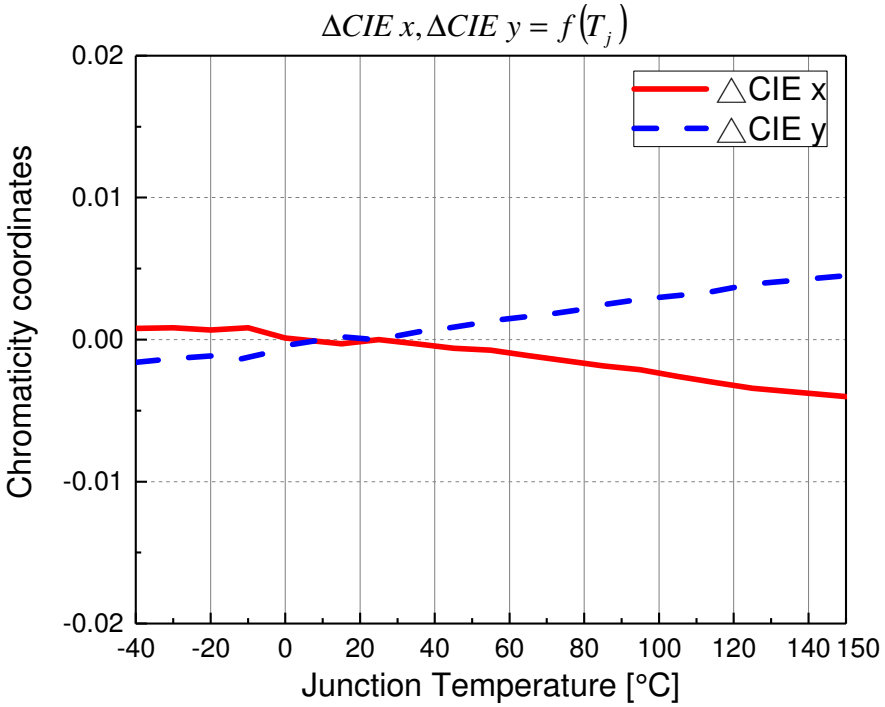
Relative Luminous Flux vs. Junction Temperature @ I_F = 350mA (PA)



Chromaticity Coordinates Shift vs. Junction Temperature @ I_F = 150mA (SR)

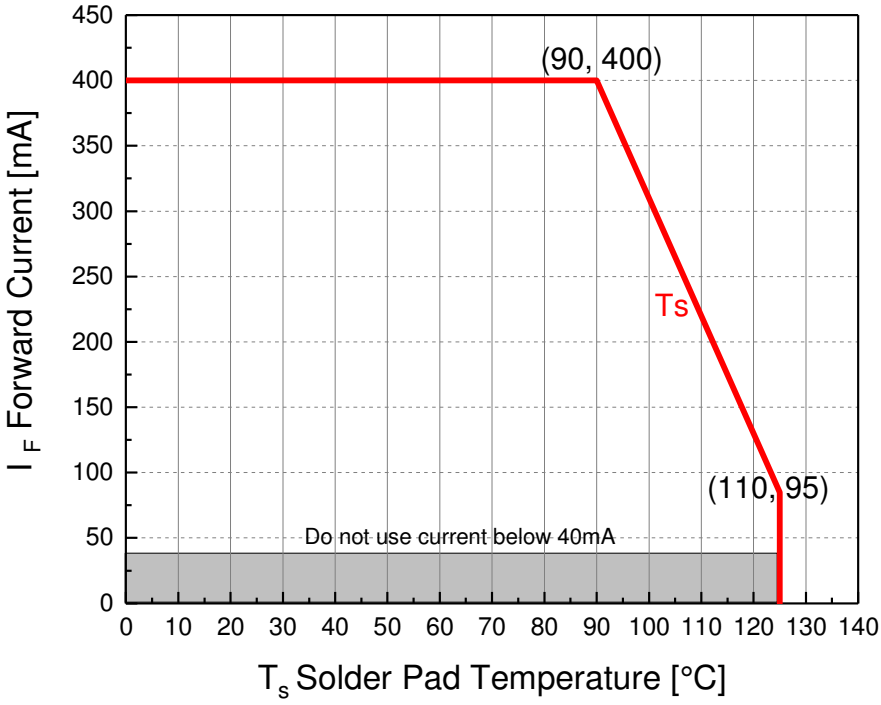


Chromaticity Coordinates Shift vs. Junction Temperature @ I_F = 350mA (PA)



Forward Current Derating Curve (SR / PA)

$$I_F = f(T_S)$$



4. Binning Information

Luminous Flux Bins

[Super Red]			
Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
E	4	8	10
	5	10	13
	6	13	17
	7	17	20
	8	20	23
	9	23	27
F	1	27	33
	2	33	39
	3	39	45

[PC Amber]			
Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
E	8	20	23
	9	23	27
F	1	27	33
	2	33	39
	3	39	45
	4	45	52
	5	52	60
	6	60	70
	7	70	80

Notes:

1. Luminous flux measurement tolerance: ±8%.
2. Highlighted Black Box is available bins.

Forward Voltage Bins

Bin	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
1012	1.00	1.25
1215	1.25	1.75
1517	1.50	1.75
1720	1.75	2.00
2022	2.00	2.25
2225	2.25	2.50
2527	2.50	2.75
2730	2.75	3.00
3032	3.00	3.25
3235	3.25	3.50
3537	3.50	3.75
3740	3.75	4.00
4042	4.00	4.25
4245	4.25	4.50
4547	4.50	4.75
4750	4.75	5.00
5052	5.00	5.25
5255	5.25	5.50
5557	5.50	5.75
5760	5.75	6.00
6062	6.00	6.25
6265	6.25	6.50
6567	6.50	6.75
6770	6.75	7.00

Notes:

1. Forward voltage measurement tolerance: ±0.05V.
2. Forward voltage bins are defined SR at I_F = 150mA and PA at I_F = 350mA operation.

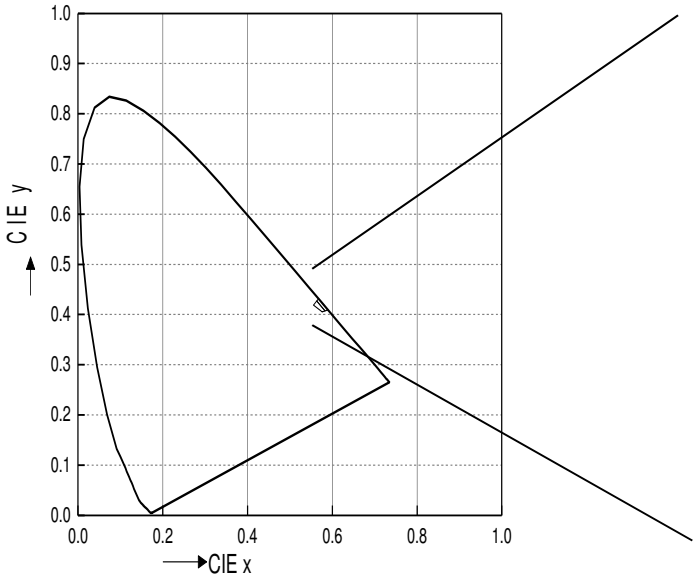
Dominant Wavelength Bins

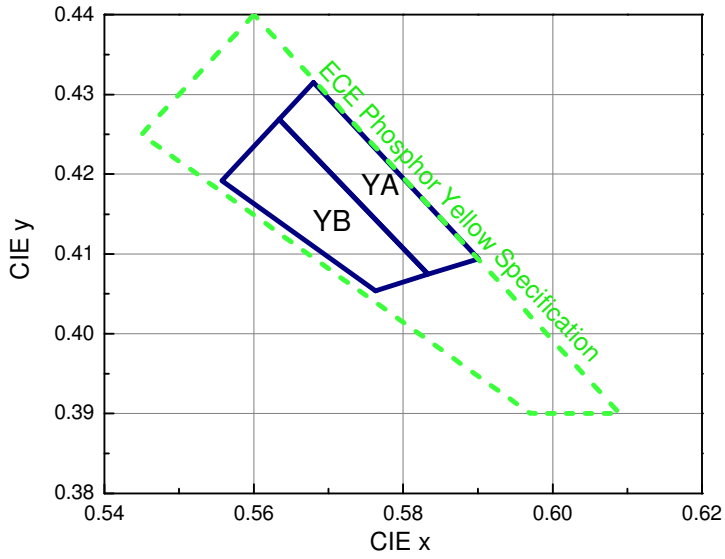
Group Bin	Minimum Dominant Wavelength [nm]	Maximum Dominant Wavelength [nm]
5963	459	463
6367	463	467
6771	467	471
7175	471	475
1015	510	515
1520	515	520
2025	520	525
2530	525	530
3035	530	535
5861	558	561
6164	561	564
6467	564	567
6770	567	570
7073	570	573
7376	573	576
7679	576	579
7982	579	582
8285	582	585
8588	585	588
8891	588	591
9194	591	594
9497	594	597
9700	597	600
0003	600	603
0306	603	606
0609	606	609
0912	609	612
1215	612	615
1518	615	618
1821	618	621
2124	621	624
2427	624	627
2730	627	630
3033	630	633
3336	633	636
3639	636	639

Notes:

1. Dominant wavelength measurement tolerance: ±1n

Color Bin Structure
ECE Bin Structure





PC Amber Bin Coordinates

Bin	CIE x	CIE y
YA	0.5680	0.4315
	0.5634	0.4269
	0.5833	0.4075
	0.5901	0.4094

Bin	CIE x	CIE y
YB	0.5763	0.4054
	0.5833	0.4075
	0.5634	0.4269
	0.5557	0.4192

Notes:

1. Color coordinates measurement tolerance: ±0.005.

5. Part Number

3735-SRPA3501H-AM

Part number is designated with below details.

3735 = Product family name.

SR and PA = Color [1]

350 = Test current [mA]

1 = Lead frame type (0=Ag ; 1=Au)

H = Brightness level (H=High ; M=Medium ; L=Low)

AM = Automotive application

Note : [1] Color :

Symbol	Description
C	Cool White
N	Neutral White
W	Warm White
PA	Phosphor Converted Amber
PR	Phosphor Converted Red
UB	Blue
IB	Ice Blue
SB	Sky Blue
UP	Purple
UG	Green
UY	Yellow
UA	Amber
UR	Red
SR	Super Red
RGB	RGB-Color
PYG	Phosphor Converted Yellow Green

6. Ordering Information

3735-SRPA3501H-ABCDEF-1T-AM

Part Number of the 3735	Order Code
3735-SRPA3501H-AM	3735-C8PA3501H-ABCDEF-1T-AM

Order code contains information with below details：

ABCDEF = Group Bin[1]

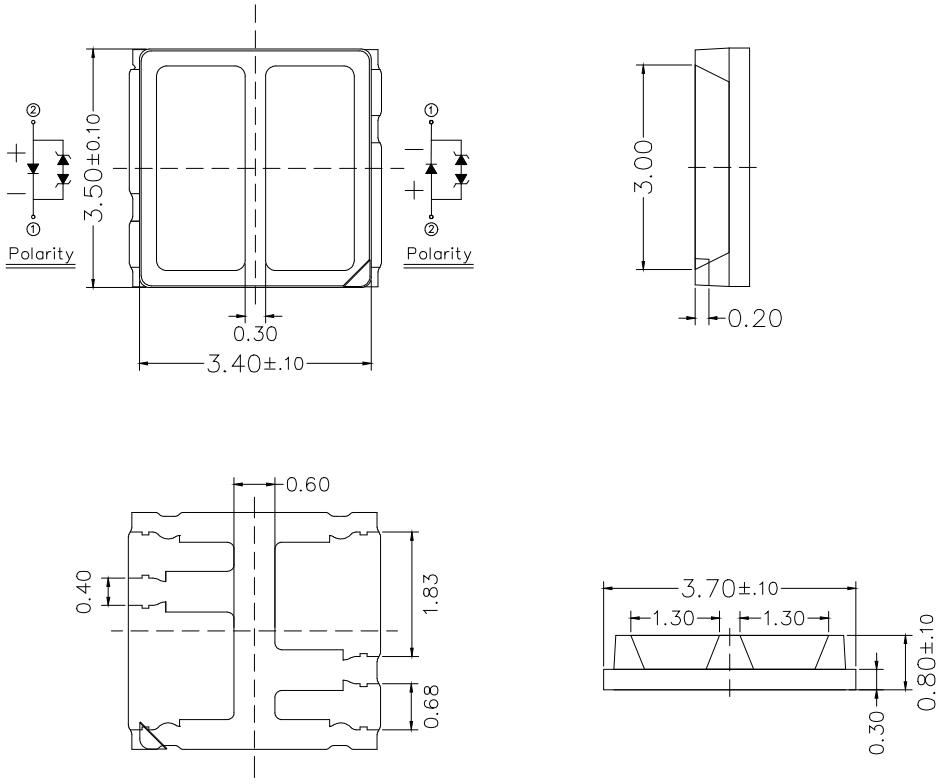
1T = Internal Code

Note:

[1] Group Bin Chart：

Group Bin	Bin Coordinates	IV	VF
B01162	CW: 53A64D PA: YAYB	CW: F9J3 PA: F4F6	3240
2733	SR:2733 PA:YAYB	SR:E5E8 PA:F4F6	SR:1730 PA:3240

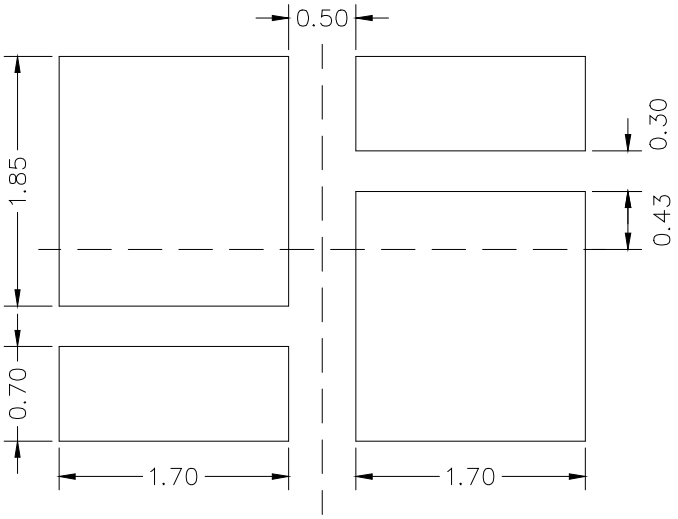
7. Mechanical Dimension



Notes:

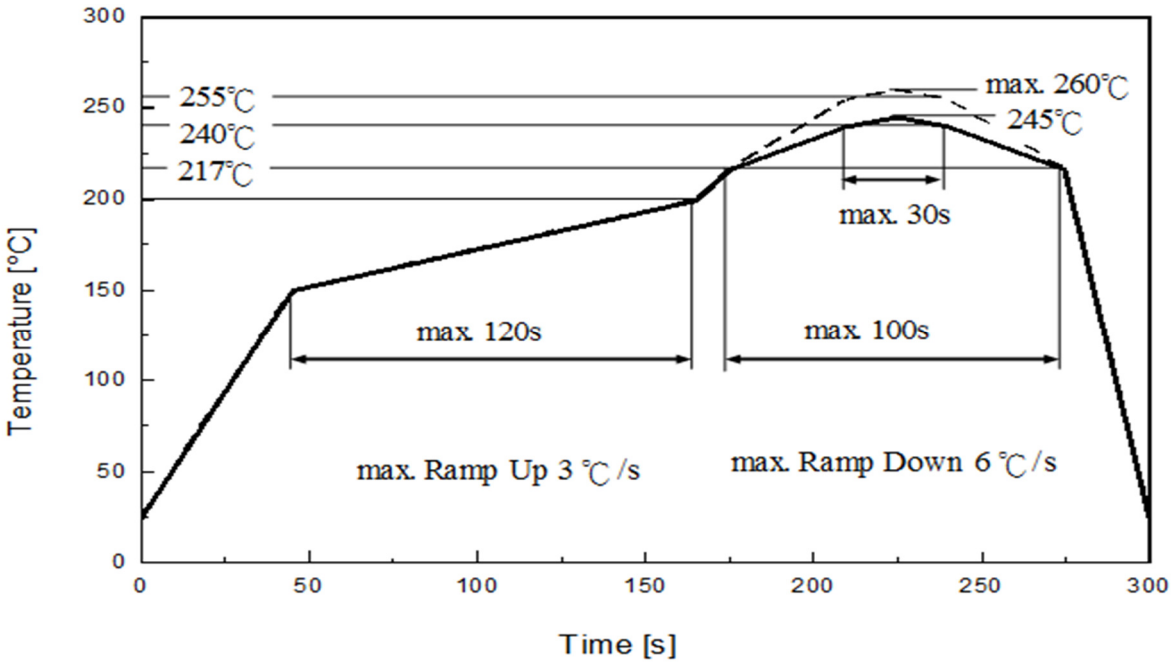
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.1mm.

8. Recommended Soldering Pad



9. Reflow Soldering Profile

Soldering Condition (Reference: IPC/JEDEC J-STD-020D)

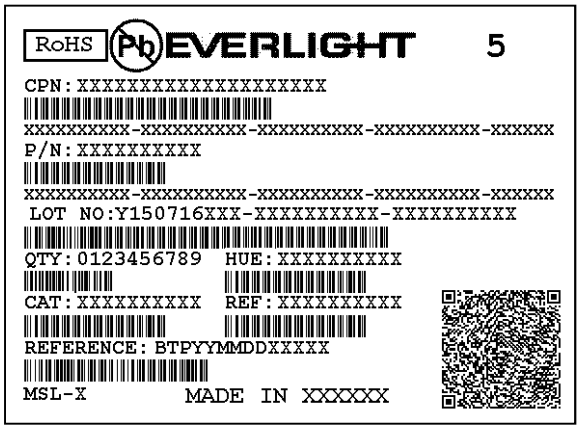


Profile Feature	Pb-Free Assembly	Unit Einheit
Ramp-up rate to preheat 25 ℃ to 150 ℃	3	℃ /sec
Time of soaking zone 150 ℃ to 200 ℃	120	sec
Ramp-up rate to peak	3	℃ /sec

Liquidus temperature	217	℃
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	℃
Time within 5℃ of the specified peak temperature	30	sec
Ramp-down Rate (max.)	6	℃ /sec

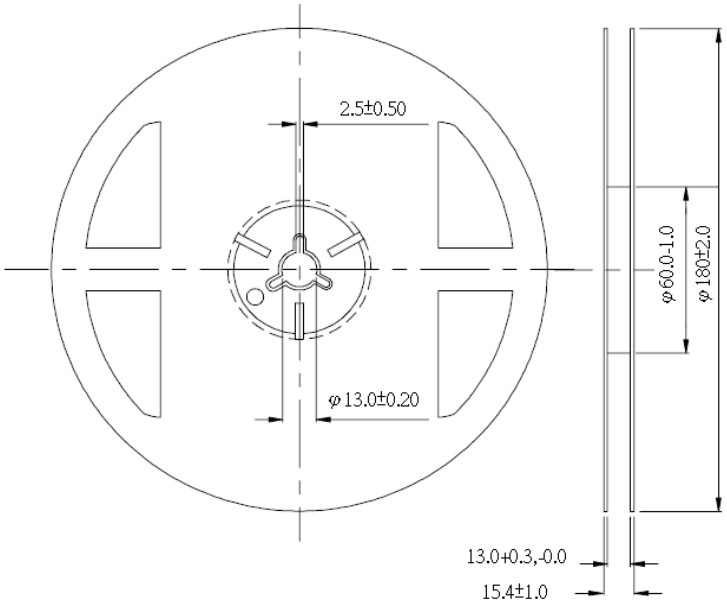
10. Packaging Information

• Product Labeling



- CPN：Customer's Product Number
- P/N：Everlight Part Number
- LOT NO：Lot Number
- QTY：Packing Quantity
- HUE：Color Bin
- CAT：Luminous Flux (Brightness) Bin
- REF：Forward Voltage Bin

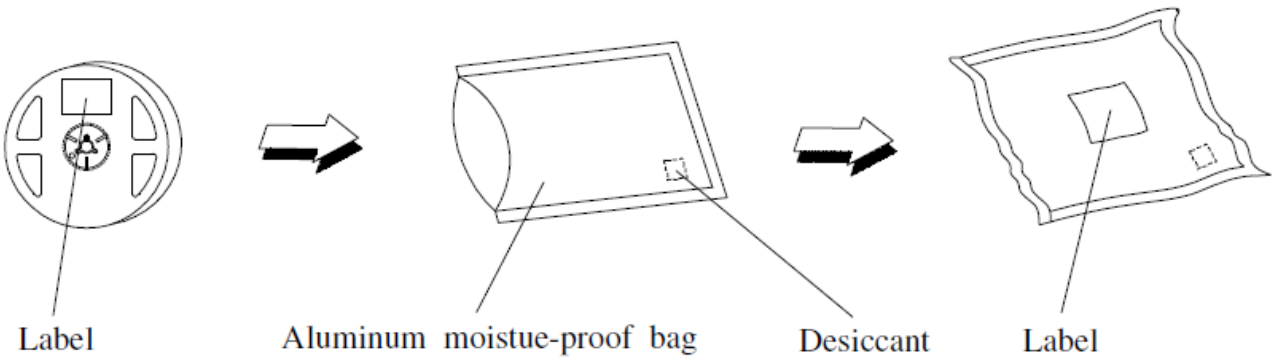
- **Reel Dimensions**



Notes:

Dimensions are in millimeters.

Moisture Resistant Packing Process



11. Precaution for Use

1. Over-current-proof
   Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (burn out will happen).

2. Assemblies
   Do not stack assemblies containing LEDs to prevent damage to the optical surface of LEDs. Forces applied to the optical surface may result in the surface being damaged.

3. Soldering Condition
   3.1 When soldering, do not put stress on the LEDs during heating.
   3.2 After soldering, do not warp the circuit board.

4. Soldering Iron
   Each terminal is to go to the tip of soldering iron temperature less than 350℃ for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing
   Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.