

EL TOP VIEW LED A09K-UR1501H-AM



Features

- Package : PLCC 6 package
- Color : Red
- Typ. Luminance Intensity : 9200 mcd @ 150mA
- Viewing angle : 120°
- ESD : 8KV
- MSL : 2
- Qualified AEC-Q102
- Sulfur robustness
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)

Applications

- Automotive exterior lighting
- CHMSL
- Tail lamp
- Stop lamp

Contents

1. Characteristics	3
2. Absolute Maximum Ratings	4
3. Characteristics Graph	5
4. Binning Information	10
5. Part Number.....	13
6. Ordering Information	14
7. Mechanical Dimension.....	15
8. Recommended Soldering Pad.....	16
9. Reflow Soldering Profile.....	16
10. Packaging Information.....	17
11. Precaution for Use	19

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1. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	I_F	20	150	200	mA	---
Luminous Intensity	I_V	7100	9200	14000	mcd	$I_F=150\text{mA}$
Forward Voltage	V_F	1.75	2.15	2.75	V	$I_F=150\text{mA}$
Viewing Angle	ϕ	---	120	---	deg	$I_F=150\text{mA}$
Dominant Wavelength	λ_d	609	613	624	nm	$I_F=150\text{mA}$
Thermal Resistance (Junction to Solder)	Real	$R_{th JS real}$	---	---	60	K/W $I_F=150\text{mA}$
	Electrical	$R_{th JS el}$	---	---	50	

Notes:

1. Luminous Flux measurement tolerance: $\pm 8\%$.
2. The data of Luminous Flux measured at thermal pad= 25°C
3. Forward voltage measurement tolerance: $\pm 0.05\text{V}$
4. The V_F range shown in the table above indicates 99% output.
5. Tolerance of Dominant Wavelength : $\pm 1\text{nm}$.

2. Absolute Maximum Ratings

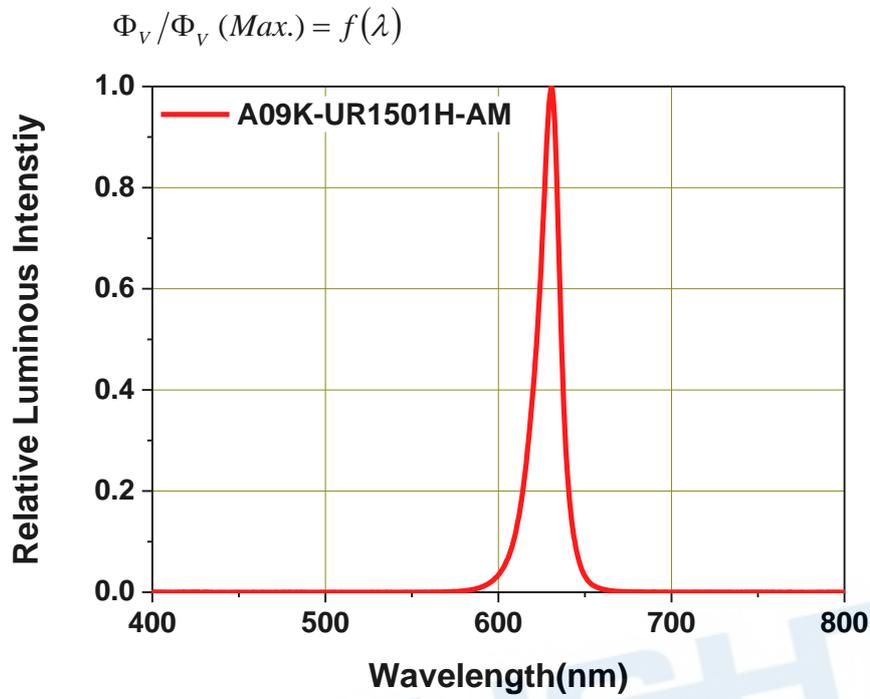
Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	550	mW
Forward Current	I_F	200	mA
Surge Current ($t \leq 10 \mu s$; $D=0.005$; $T_s=25^\circ C$)	I_{FM}	1000	mA
Reverse Voltage	V_R	Not designed for reverse operation	V
Junction Temperature	T_J	125	$^\circ C$
Operating Temperature	T_{opr}	-40 ~ +110	$^\circ C$
Storage Temperature	T_{stg}	-40 ~ +110	$^\circ C$
ESD Sensitivity ($R=1.5k\Omega$, $C=100pF$)	ESD_{HBM}	8	kV
Soldering Temperature	Reflow	260 $^\circ C$ for 30sec	$^\circ C$

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3. Characteristics Graph

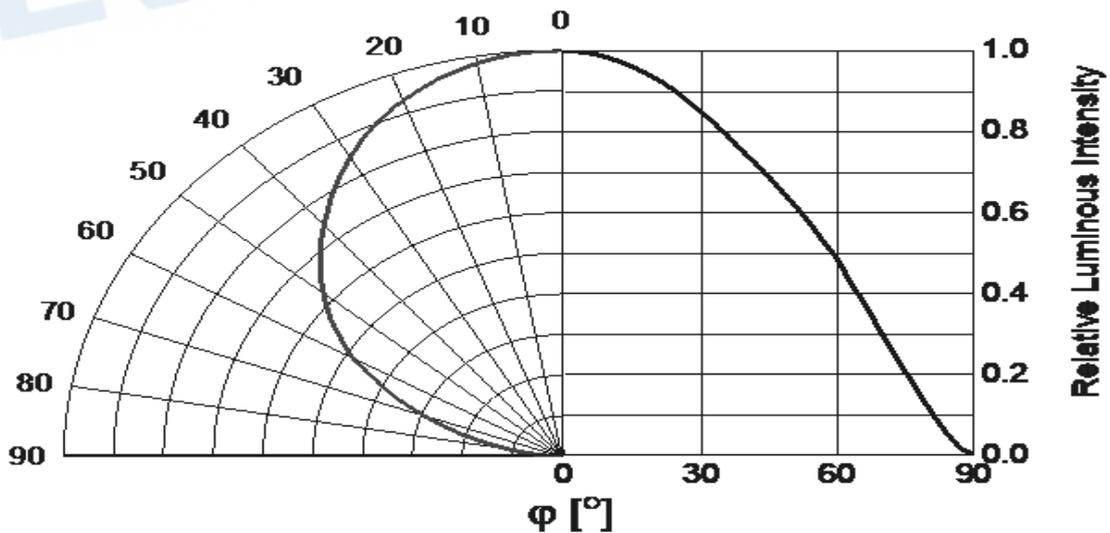
Wavelength Characteristics Relative Spectral Distribution

@ Ts = 25°C, If=150mA



Typical Diagram Characteristics of Radiation

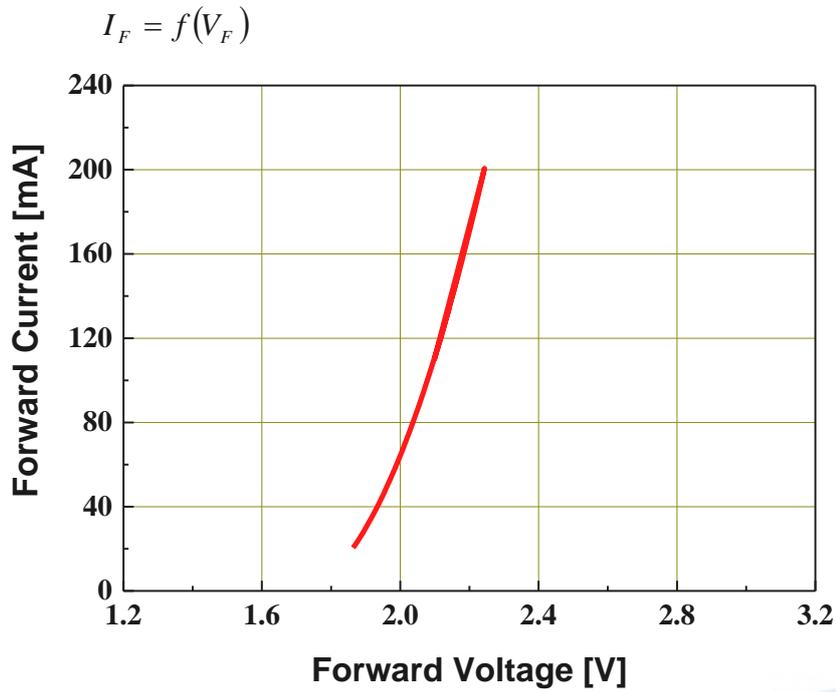
$\Phi_v / \Phi_v (0^\circ) = f(\varphi)$



Notes:

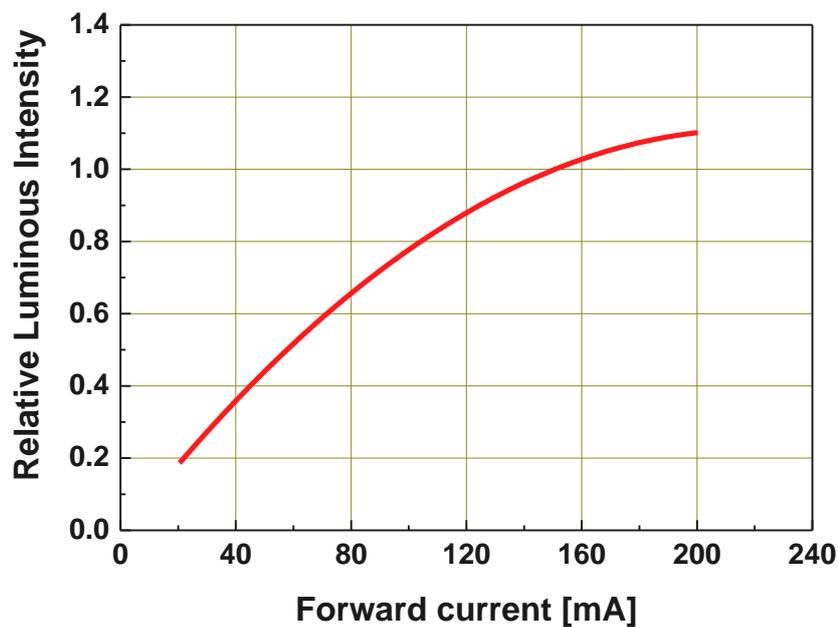
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is $\pm 5^\circ$.

Forward Current vs. Forward Voltage @ Ts = 25°C



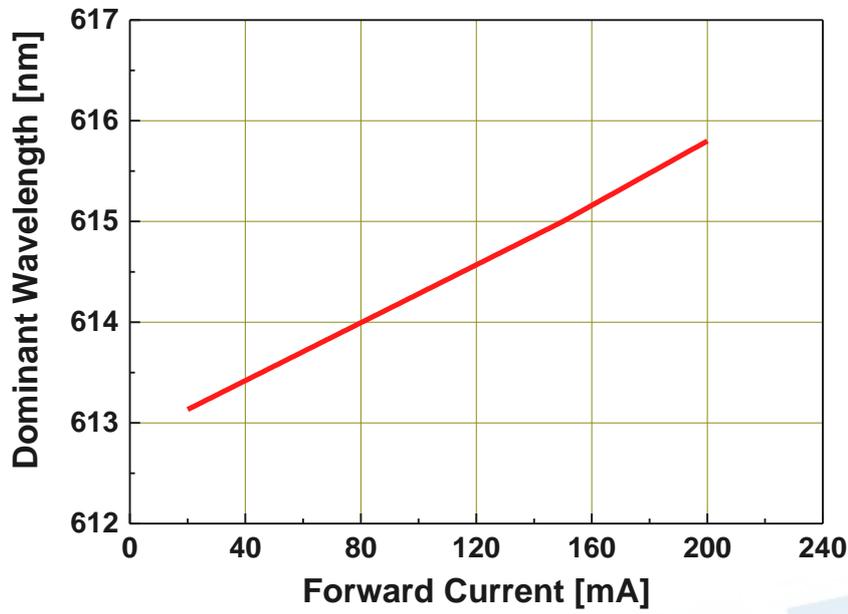
Relative Luminous Intensity vs. Forward Current @ Ts = 25°C

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



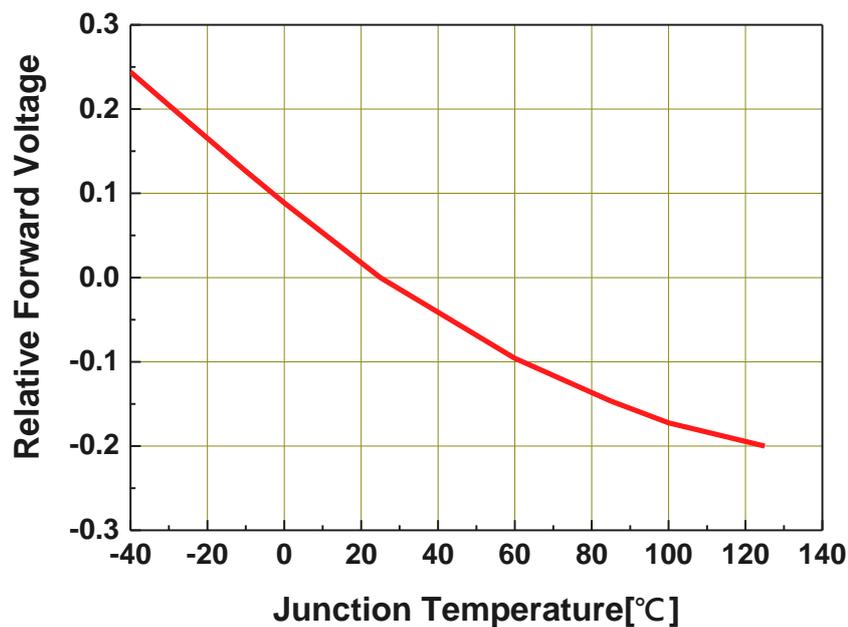
Dominant Wavelength vs. Forward Current @ Ts = 25°C

$$\lambda_d = f(I_F)$$



Relative Forward Voltage vs. Junction Temperature @ IF=150mA

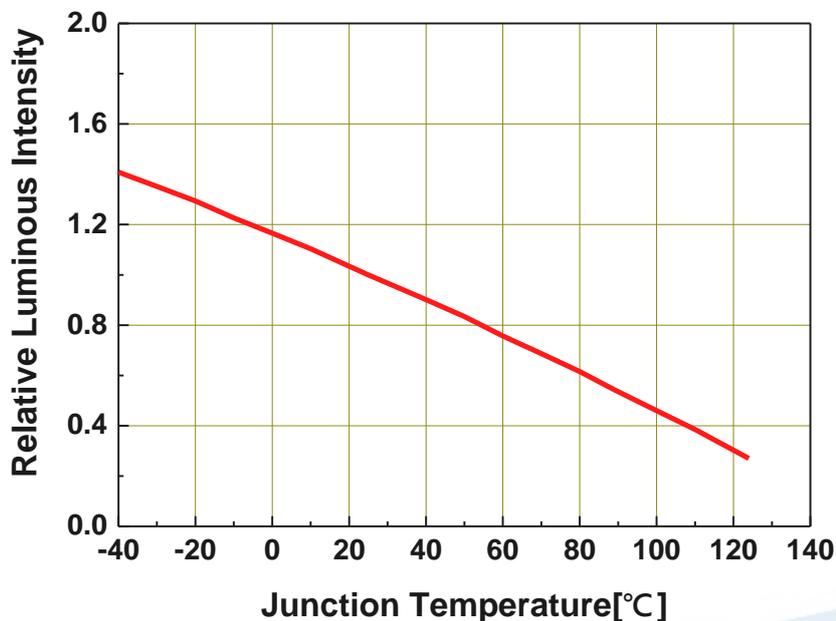
$$\Delta V_F = V_F - V_F(25^\circ C) = f(T_j)$$



Relative Luminous Intensity vs. Junction Temperature

@ $I_F=150\text{mA}$

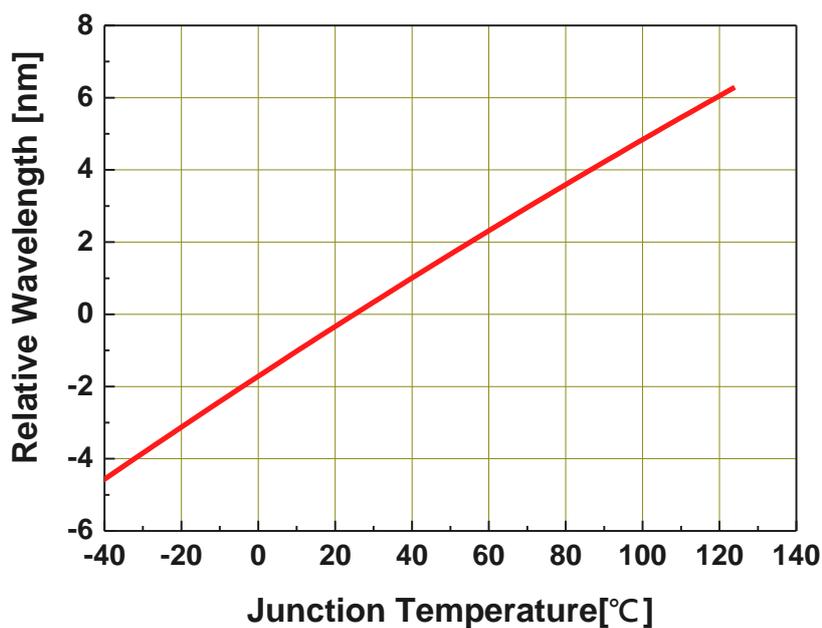
$$\Phi_v / \Phi_v(25^\circ\text{C}) = f(T_j)$$



Relative Wavelength vs. Junction Temperature

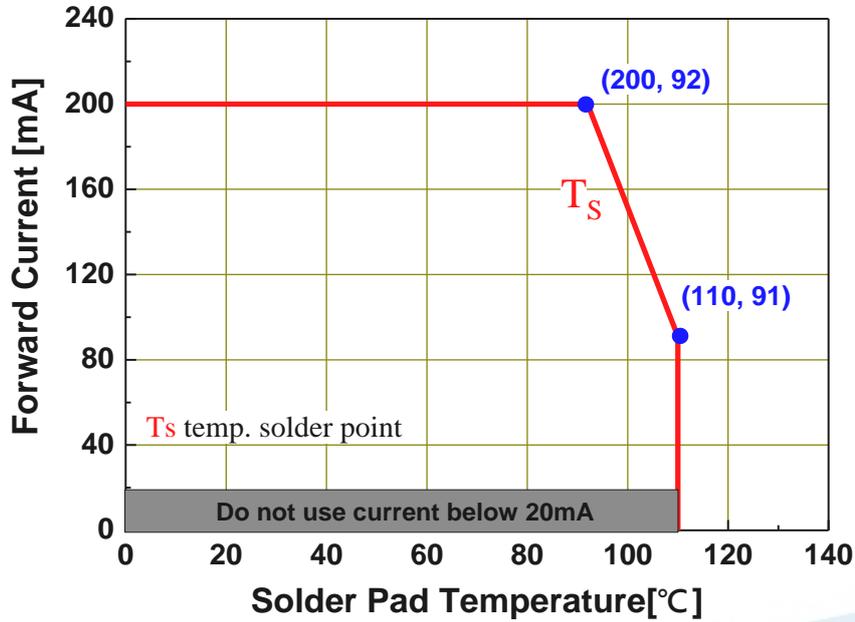
@ $I_F=150\text{mA}$

$$\Delta\lambda_d = \lambda_d - \lambda_d(25^\circ\text{C}) = f(T_j)$$



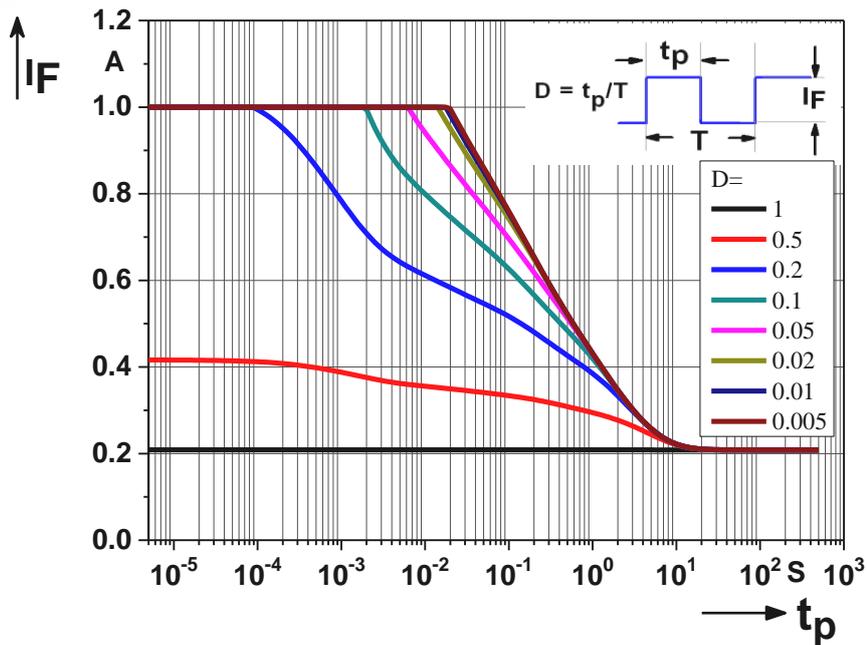
Forward Current Derating Curve

$$I_F = f(T_S)$$



Permissible Pulse Handling Capability

D=Duty cycle , $T_s = 25^\circ\text{C}$



4. Binning Information

Luminous Intensity Bins

Group Bin	Luminous Intensity (mcd)		Luminous flux (lm)(for reference)	
	Min.	Max.	Min.	Max.
L1	11.2	14	0.035	0.044
L2	14	18	0.044	0.057
M1	18	22.4	0.057	0.070
M2	22.4	28	0.070	0.088
N1	28	35.5	0.088	0.112
N2	35.5	45	0.112	0.142
P1	45	56	0.142	0.176
P2	56	71	0.176	0.223
Q1	71	90	0.223	0.283
Q2	90	112	0.283	0.352
R1	112	140	0.352	0.440
R2	140	180	0.440	0.566
S1	180	224	0.566	0.704
S2	224	280	0.704	0.881
T1	280	355	0.881	1.12
T2	355	450	1.12	1.42
U1	450	560	1.42	1.76
U2	560	710	1.76	2.23
V1	710	900	2.23	2.83
V2	900	1120	2.83	3.52
AA	1120	1400	3.52	4.40
AB	1400	1800	4.40	5.66
BA	1800	2240	5.66	7.04
BB	2240	2800	7.04	8.81
CA	2800	3550	8.81	11.2
CB	3550	4500	11.2	14.2
DA	4500	5600	14.2	17.6
DB	5600	7100	17.6	22.3
EA	7100	9000	22.3	28.3
EB	9000	11200	28.3	35.2
FA	11200	14000	35.2	44.0
FB	14000	18000	44.0	56.6
GA	18000	22400	56.6	70.4

Notes:

1. Luminous flux measurement tolerance: $\pm 8\%$.
2. Highlighted Black Box is possible output bins.

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: $\pm 1\text{nm}$.
2. Highlighted Black Box is possible output bins.

Forward Voltage Bins

Bin code	Min Forward Voltage [V]	Max Forward Voltage [V]
1012	1.00	1.25
1215	1.25	1.50
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: $\pm 0.05V$.
2. Forward voltage bins are defined at $I_F = 150mA$ operation.
3. Highlighted Black Box is possible output bins.

5. Part Number

A09K-UR1501H-AM

Part number is designated with below details.

A09K = Product family name.

UR = Color ^[1]

150 = Test current [mA]

1 = internal code

H = Brightness Level

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
UYG	Brilliant Yellow Green
UPG	Pale Green
UA	Amber
UR	Red
SR	Super Red
RGB	RGB-Color
PYG	Phosphor Converted Yellow Green

6. Ordering Information

A09K- UR1501H-**ABCDEFGHIJKLM**-NO-AM

Part Number of the A09K	Order Code
A09K-UR1501H-AM	A09K-UR1501H-ABCDEFGHIJKLM-NO-AM

Order code contains information with below details :

ABCD = min/max wavelength or CCT

EFGH = min./max. luminous flux in [lm] or luminous intensity in [mcd]

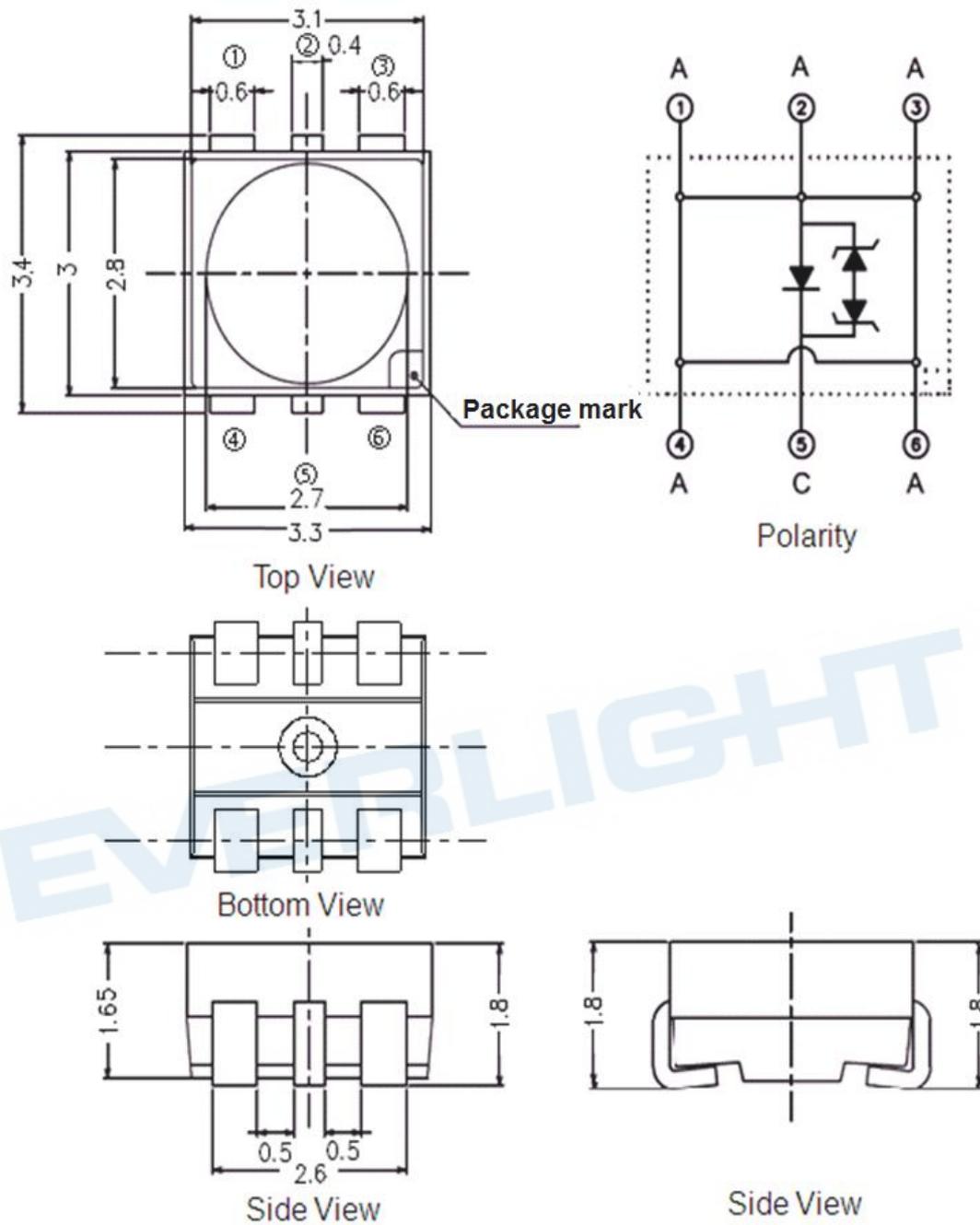
JKLM = min./max. forward voltage

NO = internal code

AM = Automotive Application

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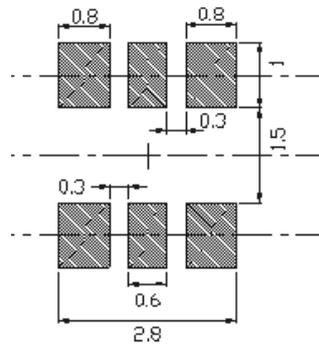
7. Mechanical Dimension



Notes:

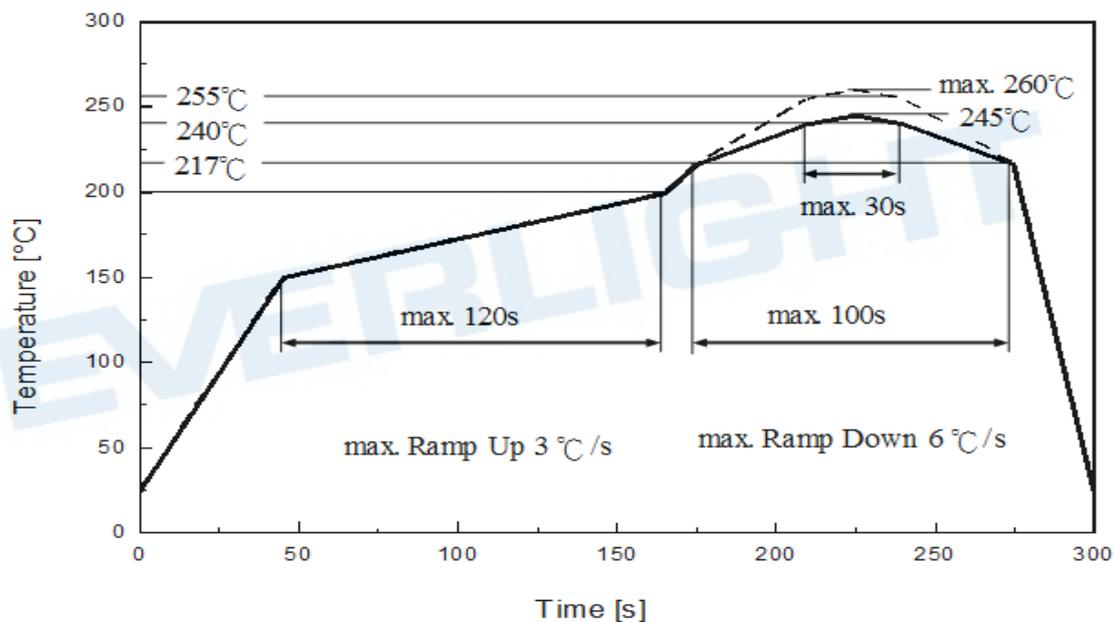
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

8. Recommended Soldering Pad



9. Reflow Soldering Profile

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



Profile Feature	Pb-Free Assembly	Unit
	Recommendation	
Ramp-up rate to preheat 25 °C to 150 °C	3	°C /sec
Time of soaking zone 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within 5°C of the specified peak temperature	30	sec
Ramp-down Rate (max.)	6	°C /sec

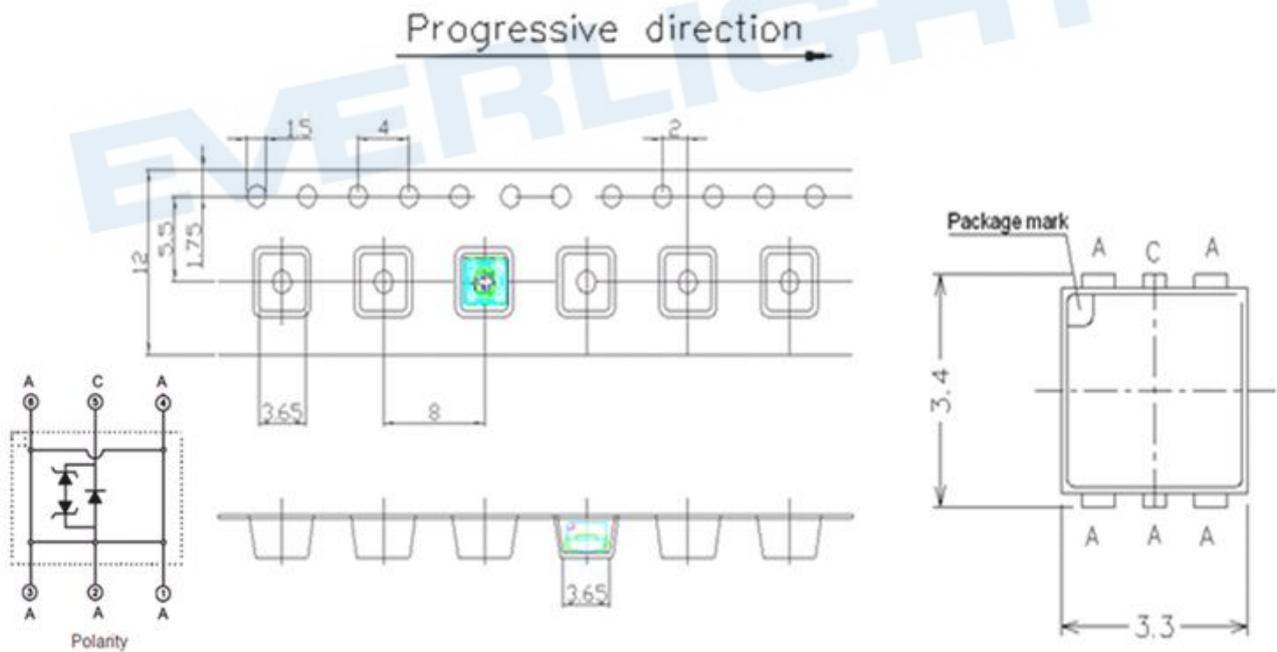
10. Packaging Information

• Product Labeling



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

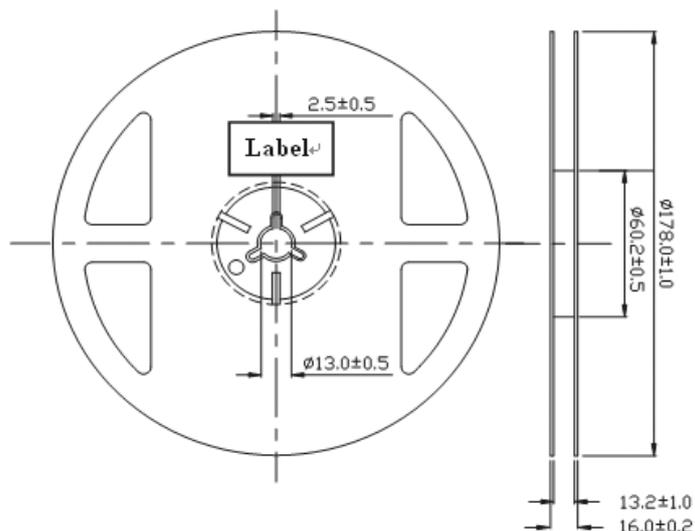
• Packing: Loaded Quantity 1000 pcs Per Reel



Notes:

1. Dimensions are in millimeters.

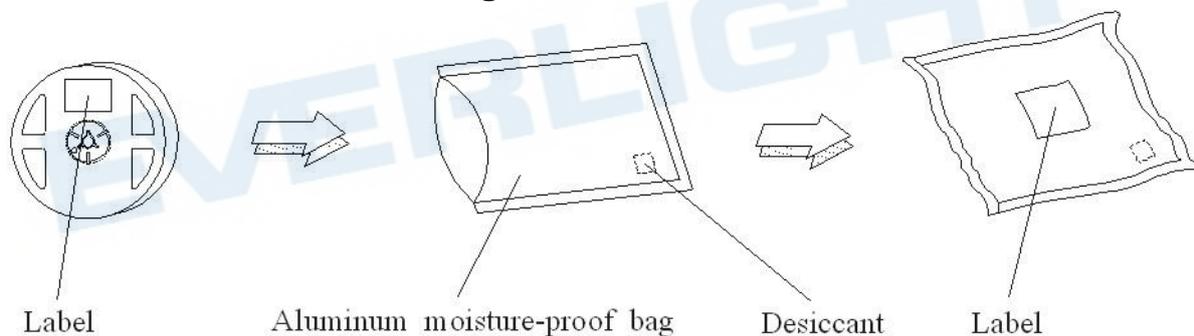
● **Reel Dimensions**



Notes:

1. 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.

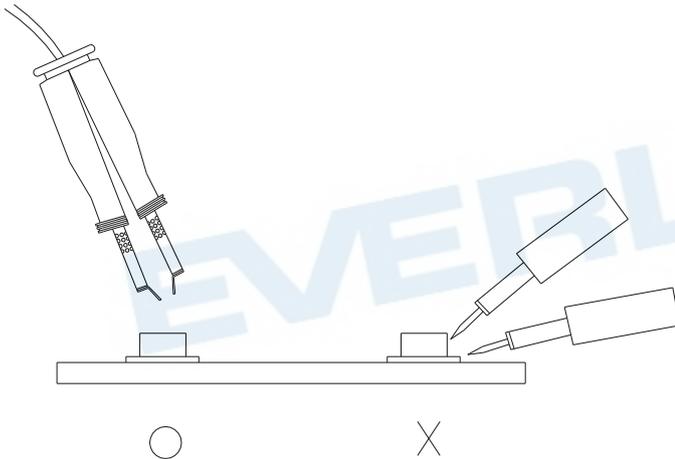
3.2 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C 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.



Revision History

Current version : Nov.26.2024

Issue No: DSE-0016637

Version: 8.0

Rev.	Subjects (major change in previous version)	Modified date
1	Standard datasheet	2016/09/07
2	Add MSL, surge current, Permissible Pulse Handling Capability fig Modify Operating Temperature & Storage Temperature	2017/3/16
3	Modify Luminous Intensity	2017/09/06
4	Modify Packaging Information	2018/09/14
5	Modify Luminous Intensity and Dominant Wavelength	2019/03/06
6	Revise Qualified AEC-Q102 level	2023/05/19
7	Add Luminous flux Bin	2023/08/14
8	Revise Luminous flux Bin	2024/11/27

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